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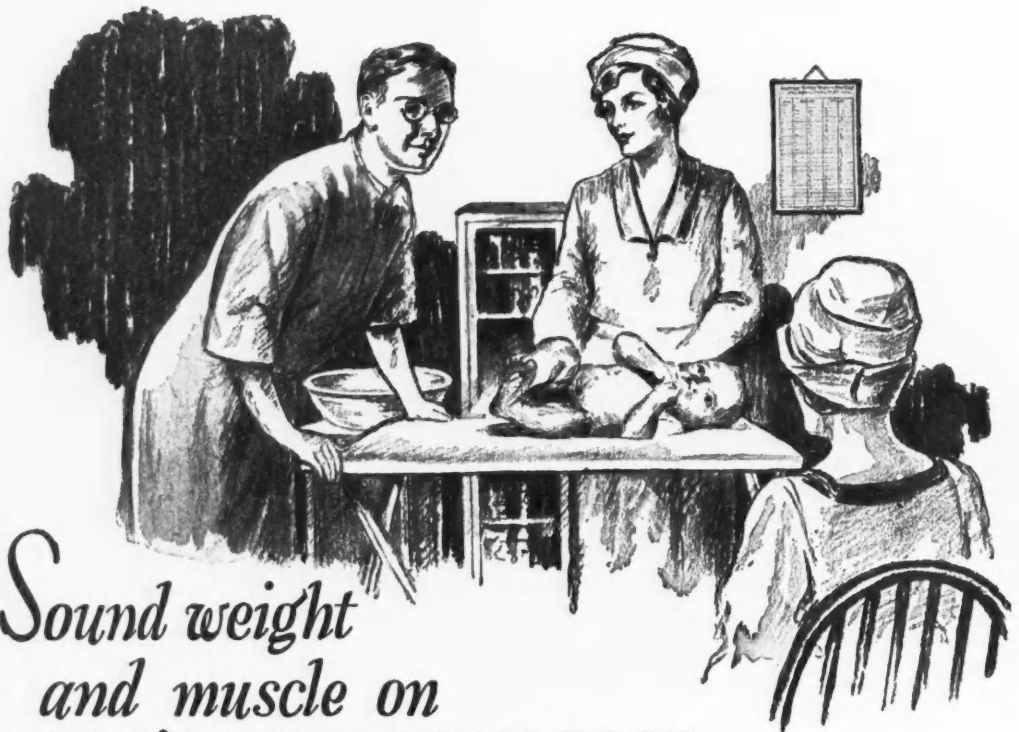
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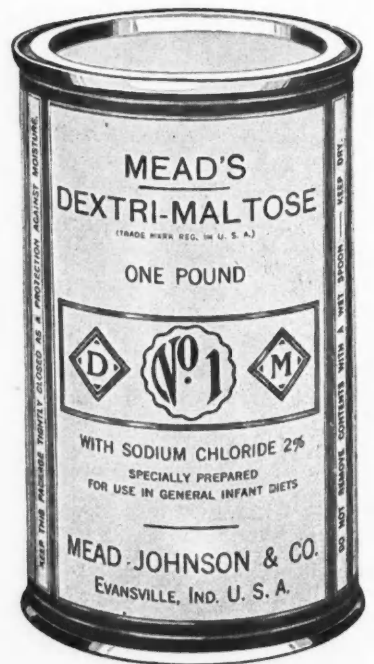
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CALIFORNIA AND WESTERN MEDICINE

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ECLAMPTOGENIC TOXEMIA*

ITS MANAGEMENT

By FREDERICK HOWARD FALLS, M. D.
Chicago, Illinois

ECLAMPTOGENIC toxemia, like the poor, is always with us. In spite of an immense amount of research and speculation little progress has been made in arriving at the fundamental factors underlying its origin and development. However, great progress has been made by specialists in the management of the disease, so that the mortality and morbidity have been consistently and appreciably lowered in various parts of the world. However, Litzenberg has pointed out that the mortality rate advanced 5 per cent between 1915 and 1925 in the registered area of the United States. When we attempt to explain these facts several factors seem to be of importance.

INFLUENCE OF BETTER INSTITUTIONAL CARE

The prenatal management of the pregnant woman is today far better in many communities than formerly. Institutions like the Cook County Hospital now have regularly attended prenatal clinics where the great bulk of the obstetrical patients are seen and examined regularly and carefully.

Separate institutions, devoted entirely to obstetrical work and serving as a model in technique for the general hospitals, have developed in the larger population centers.

These institutions have influenced the situation in several ways:

1. By giving increasingly good obstetrical care to the patients.
2. By setting up competition standards which other institutions are forced to meet.
3. By serving as training ground for the development of young specialists, good students, and well-trained nursing personnel.
4. By dignifying the science of obstetrics in the eyes of both the profession and laity so that its problems and dangers are considered seriously.
5. By having the general hospitals recognize the importance of proper accommodations for the obstetrician and his patients, and by giving a service comparable to that which is put at the disposal of the general and other surgeons.

* From the Department of Obstetrics and Gynecology, College of Medicine, University of Illinois, Chicago, Illinois.

* Read before the California Medical Association in General Meeting at the Fifty-Eighth Annual Session, May 6-9, 1929.

In addition to the above factors, more time and effort are being expended in some of the medical schools on the teaching of obstetrics, and more and more of the schools are furnishing their students part time paid instructors for this purpose.

Hospitalization of obstetric patients has become almost the rule in the larger centers, and this obviously permits closer observation during labor and the early puerperium; and permits of more rapid and efficient surgical intervention when this becomes necessary.

DETERRENT FACTORS

In addition to these advantages that the modern woman possesses and which her sister of several decades ago did not possess, there are, however, certain disadvantages which she has to assume that were formerly less prevalent. The average woman of today, I believe, is less rugged physically and probably immunologically, than the woman of thirty or forty years ago. Their lives are more sedentary, and they are less exposed to those ordinary slight wound infections which tend to stimulate general immunity.

There are more surgeons who are technically capable of doing a cesarean section but who have no conception of the fundamental obstetrical principles underlying the indications for operation in a given case. These men are called in consultation on obstetrical cases frequently. They know how to do a cesarean section, but have no ability or experience with other forms of obstetrical operations. Naturally they take the easiest way out. The patients, in most instances, would be far better off under strict medical management. Too often the patient is operated in a general operating room of a general hospital with a personnel actively engaged in the care of acute osteomyelitis, mastoiditis, empyema, and other pus infections. There has developed also an unwarranted "furor operativa" in some parts of the country sponsored by well-trained obstetricians. Such men are able to carry out these operations with a minimum of complications, but such practice leads inevitably to disaster when attempted by younger and less skilled individuals. All of these factors help to govern the mortality and morbidity rate in eclamptogenic toxemia.

ETIOLOGY

With these facts in mind let us consider what we know about the etiology of eclampsia. We can practically disregard the various theories that have been advanced and which attempt to explain

its fundamental mechanism, all of which have been more or less discredited.

Several facts are accepted by all:

1. Eclampsia occurs only in pregnant or recently pregnant females.

2. It is associated with degenerative changes in the parenchymatous organs, chiefly the liver, kidney, heart, and brain; but the lesions are not constant.

3. Hard physical work and a diet rich in protein predispose materially to the appearance and aggravation of the physical signs and symptoms.

4. The disease is rarely seen before the sixth month of pregnancy.

5. As a rule, there is a marked increase in the coagulability of the blood.

6. In most of the nonlethal cases clinical recovery is remarkably rapid and complete.

From the above facts I have endeavored to develop a conception of what is the matter with these women, and to outline a treatment based on this that would seem to fulfill the requirements. There is nothing fundamentally new in this, but the factors involved I feel have not been sufficiently stressed in this connection.

It has been shown by Vaughn and others that the protein molecule is highly toxic when split by enzymes in a certain way and to a certain degree. Thus egg-white, casein, or any apparently harmless protein substance contains a powerful and dangerous radicle if split in a certain way. This toxin may, on the other hand, be made completely innocuous by further splitting into its end products. We believe that the eclamptogenic toxemia woman is intoxicated by the products of protein metabolism. Our conception of the pregnant woman can best be appreciated by examining the diagram which I have prepared.

We believe that the pregnant woman is intoxicated from three main sources:

1. From the fetus and placenta directly and by the metabolic changes brought about in the maternal organism by their presence.

2. From the endogenous protein metabolic waste products.

3. From the exogenous protein metabolic waste products.

As a defense against these split protein toxins, the pregnant woman has:

1. The kidney, which is by far the most important factor in their elimination.

2. The bowels, which by stimulation can be made to assume part of the burden of excretion.

3. Blood-letting, which may play an important rôle under certain conditions.

The level of toxins in the blood at any given time depends on the ratio between intake and output of toxins. It is assumed that this level is constantly higher in the average pregnant woman than in the same woman when not pregnant, which may account for the slight and transient toxic symptoms so frequently seen in normal pregnant women, at or near term.

In considering the etiology of the disease we must further consider the harmful effect on the

mechanism of toxin elimination and neutralization that is probably produced by the serious lesions found in the kidneys and liver, and the general depressant effect which pathologic changes in the brain and in the cardiac system must have on the vital processes. It is apparent that once these deleterious effects are produced a vicious cycle is started. The more the liver and kidney, heart and brain are damaged the more toxin accumulates in the blood, and the more toxemia the greater the damage to these organs.

PLAN OF TREATMENT

Any management, therefore, suggested for the treatment of eclamptogenic toxemia must aim at:

1. The reduction to the minimum of the influx of protein metabolic split products to spare the kidney especially.

2. The elimination as rapidly as possible of the toxic elements circulating in the blood in order to reduce the damage to the brain, heart, and liver.

3. The protection of the patient from injury during unconscious periods.

4. The support of the cardiac and respiratory centers until the peak of the intoxication is passed.

In addition to these factors we must consider the best way to meet the obstetrical problem involved, namely, the delivery of the baby, so that both the mother and baby may have the best chances for life and health, and the mother for future pregnancies.

It is obvious, therefore, that the treatment of eclamptogenic toxemia is a complex, not a simple, problem, and depends for its proper solution on a careful estimation of the various factors, favorable and unfavorable, that present themselves in different patients, and not infrequently in the same patient under various circumstances. The fundamental principle to be stressed is, we believe, that the condition is a protein split product intoxication, and that the reduction or elimination of these products is the rational method of attack or approach in treatment.

TREATMENT GROUPS

To this end we have divided patients, as they present themselves, into six main groups; and while realizing that the grouping does not cover all possibilities, nevertheless feel that it is sufficiently comprehensive to serve our purpose:

1. Normal obstetrical conditions plus mild toxemia.

2. Normal obstetrical conditions plus rapidly advancing toxemia.

3. Normal obstetrical conditions plus fulminating toxemia.

4. Abnormal obstetrical conditions plus eclamptogenic toxemia.

5. Intrapartum eclampsia.

6. Postpartum eclampsia.

MORTALITY PERCENTAGES IN DIFFERENT METHODS

Theoretically, with the proper type of prenatal supervision, eclamptogenic toxemia should be a very mild disease perfectly under our control and rarely complicated by convulsions. If we have the

proper facilities for modern obstetrical practice, death should be practically unknown from this toxemia.

The nearest approach to this standard, as reported by other writers, is the work of Stroganoff, who reports a series of two hundred and thirty personally treated cases in which the mortality was 1.7 per cent, he using his well-known expectant line of treatment. Edler, Lundquist, and others, using the Stroganoff method, report 8.5 to 20.2 per cent maternal mortality. Greenhill reports the results of cases treated by De Lee and his associates at the Chicago Lying-in Hospital, many of whom were treated actively by methods such as forceps, version, and cesarean section with a maternal mortality of 7.7 per cent.

Lazard, McNeile, and Vruwink and their associates have reported very good results in the management, especially of the convulsive stage of the disease, by the use of *magnesium sulphate* intravenously, as recommended and used by H. Einar. They use 20 cubic centimeters of a 10 per cent solution intravenously every two hours for six doses, the intervals between injections being lengthened as the patient improves. Blood pressure readings hourly are used as an index for more injections. These injections are combined with small doses of morphin or chloral and bromid per rectum. If convulsions are not imminent, 2 to 4 cubic centimeters of a 50 per cent solution may be given intramuscularly into the buttocks, two to four times a day. They were able to reduce the mortality in the neglected and desperate cases entering the Los Angeles County Hospital from 35 to 16 per cent. The *modus operandi* of this remedy is, according to Vruwink, not clear. Studies by Stander of Johns Hopkins tend to show that the method is not without some danger, if the magnesium sulphate is given too rapidly or in too concentrated solution.

Liver extract injections have recently been used by Mitler and Martinez of Pittsburgh on the supposition that, because of liver tissue destruction, the liver's normal detoxifying function was diminished, and this could be augmented and replaced by injecting liver extract. This theory we feel to be invalid because, first, there is no proof that the toxins of eclampsia can be neutralized by liver extract, or, second, that a detoxicating substance, if present in the liver cells, can be extracted in active form. Our thought is that quite the reverse might be expected, and that the toxemia might be augmented by the injection of a protein substance into a system flooded with proteolytic ferments. These writers, however, report a mortality of 6.9 per cent in only forty-three cases.

Titus and Givens have felt that the injection of *sugar solution* intravenously has a beneficial effect by supplying the immediate metabolic needs of the patient and by replenishing the depleted glycogen stores in the liver and muscles. We have not noted beneficial results from this management when used by others, and we have not adopted it.

What we wish to emphasize in this connection is the importance of the few fundamental principles that we are all familiar with in connection

with this disease. Also how unnecessary a complicated theory as to its origin or treatment is, in order to get good results in treatment. In a broad sense this is true of practically all diseases. Typhoid, rabies, diphtheria, tuberculosis, and many other diseases could be wiped out of existence if we applied thoroughly the principles we already know for their eradication. We are firmly convinced that eclampsia can and should be added to this category.

In recent years a very decided change has come about in the attitude of most obstetricians toward the *operative management* of serious eclamptogenic toxemias. This has, in great part, been due to the above mentioned results which were obtained by Stroganoff and his school. Series as low as 8.5 per cent mortality in cases collected from several clinics using Stroganoff technique have been reported. A radical attitude in the management of these cases has become heretical in the minds of many. This view is based on the almost universally improving statistics in recent years and the concomitant increase in conservative management. We feel that there is some justification for this view, but believe that there are some other factors, such as better prenatal care, more hospital facilities and, on the whole, better trained obstetrical men throughout the country. These combine to make a radical difference in the way these patients are managed before, during and after delivery. For example, at the Cook County Hospital the mortality in patients diagnosed as having eclamptogenic toxemia has for years been between 25 and 35 per cent. In the last six years, with practically the same management in every other way, a prenatal clinic was added. The mortality has dropped to 12 per cent, and it is my firm belief that, with absolute control of the patients, many of this last group also could be saved. Indeed in my clinic across the street at the Illinois Research Hospital, we have had no deaths in over two hundred and fifty cases.

TREATMENT DETAILS IN DIFFERENT GROUPS

How, then, shall we meet the specific and practical problems that present themselves in connection with this disease. The first point of emphasis is the rigidity of the discipline and importance of attention to detail. The treatment may perhaps be best considered by using the grouping previously outlined.

A. *On the management of patients coming under Group 1 (with normal obstetrical conditions and mild toxemia and gestation not longer than thirty weeks):*

1. Bed rest, in hospital if possible, on milk diet, limited to 1000 cubic centimeters if much edema.
2. Magnesium sulphate one ounce every six hours until watery bowel movement.
3. Urine analysis, twenty-four-hour specimen, and quantitative albumin, phenolsulphonephthalein test.
4. Blood count, red, white and hemoglobin, blood chemistry and systolic and diastolic blood pressure.
5. Eye-ground examination.
6. Daily body weight.

If the symptoms gradually improve we add:

7. Fruits, vegetables, cereals, butter and bread, but prohibit tea, coffee, alcohol, meat, eggs, and fish.

Improvement continuing:

8. Sitting up in room and walking around.

TABLE 1.—*Résumé of Cases of Eclampsyogenic Toxemia.*

	Preëclamptic	Nephritic
Number of cases.....	207	46
Convulsions	13—5.2%	3—6%
I. Age. Oldest	45	44
Youngest	14	20
Average	25	31.9
Optimum	15—20	35—40
II. Parity one	108	6
Two	22	4
Three	20	5
Over three	31	28
III. Pos. Wassermann	10	1
IV. General Symptoms.		
Headache	102	32
Edema	118	31
Eye	42	24
Epigastric pain	59	21
Vomiting	72	24
Convulsions	13	3—6%
V. Blood Pressure.		
Highest	235	278
Lowest	104	128
Average	163	182
VI. Urinalysis.		
Albumin	118	47
Sugar	9	4
Red blood cells.....	44	13
Casts. Hyaline	60	27
Granular	65	30
VII. Phenolsulphonaphthalein.		
Reported cases	71	35
Lowest	5%	8.1%
Highest	65%	65%
Average	32%	30%
Optimum	30—35%	25—30%
VIII. Eye grounds.		
Reported cases	16	11
Normal	10	6
Retinitis bilateral	4	3
Retinitis unilateral	1	1
Sclerosis		1
Enlarged veins	1	
IX. Blood loss.		
Greatest	2000cc.	700cc.
Least	10	50
Average	250	211
Optimum	150	100
X. Treatment.		
Venesection	14	7
Induction of labor.....	72	22
Milk diet	162	38
Bed rest	151	36
Mg SO ₄	106	40
Morphine	73	14
Saline	4	2
XI. Induction of labor.		
Bag	41	18
Quinin, castor oil.....	40	3
Rupture of membranes	5	1
XII. Type of delivery.		
Spontaneous	158	33
Forceps	19	1
Cesarean	9	7
Breech	5	
Version	6	5
Craniotomy	2	
XIII. Results.		
Maternal deaths		
Fetal deaths	26—12%	22—47%
Deformities	3	
Macerated	6	3
Under 2000	12	10
Viable babies	5—2.4%	9—19.5%

If at or near term, quinin and castor oil induction is tried, failing a slight increase in diet and exercise under close supervision.

If symptoms get worse under this regimen the management becomes the same as under Group 2.

B. *On the management of patients in Group 2 (rapidly advancing toxemia with normal obstetrical conditions):*

1. Quinin and castor oil, Watson method; failing.

2. Voorhees bag induction.

3. Termination of second stage by forceps or version and extraction; if complications ensue or are threatening.

4. Encourage postpartum hemorrhage up to 500 cubic centimeters; no pituitrin or ergot in third stage.

5. Morphine grain one-fourth hypodermatically as soon as the baby is born.

6. Diet of milk until blood pressure falls to 140 to 150 systolic, and urine begins to clear.

7. Magnesium sulphate intramuscularly or intravenously, depending on the severity of the symptoms, speed of appearance and progress.

C. *On the management of patients in Group 3 (fulminating toxic symptoms, normal obstetrical conditions):*

(a) *Ideal obstetrical surroundings:*

1. If not in labor, cesarean section; local or ethylene anesthesia especially indicated if the patient is a primipara.

2. If in first stage, cesarean section unless dilatation can be easily completed, when forceps or version may be substituted.

3. If in second stage, forceps or version, adding episiotomy; if a para one, morphine grain one-fourth after delivery of baby, and one-sixth every six hours afterward if necessary.

4. Five hundred to seven hundred cubic centimeters of blood are withdrawn from the cubital vein. The vein is best opened for this purpose. If operation is to be performed, bleeding is postponed until after the operative blood loss is known.

5. Magnesium sulphate 20 cubic centimeters of a 10 per cent solution given slowly intravenously.

6. If a multipara and markedly premature baby twenty-eight to thirty-four weeks, vaginal cesarean section may well be done.

(b) *If conditions are not ideal, due to poor hospital surroundings, inadequate help, infected patient, or incompetent operator, the Stroganoff method is advised, comprising:*

1. Morphine sulphate grain one-fourth hypodermatically as soon as patient is seen.

2. One hour later 20 to 40 grains chloral hydrate per rectum.

3. Two hours later morphine sulphate one-fourth grain hypodermatically.

4. Four hours later 30 grains chloral hydrate per rectum.

5. Six hours later 15 to 30 grains of chloral hydrate per rectum.

6. Seven hours later 20 grains of chloral hydrate per rectum.

The chloral is injected slowly in four or five ounces of warm water. The patient must be in a dark quiet room, and a light chloroform or ether anesthesia is given to prevent convulsions. Intravenous injections of magnesium sulphate may be used also as above. As soon as labor has advanced to second stage with descent, a forceps extraction may be done if the head does not advance. Unquestionably for the general man with inadequate facilities the Stroganoff method will give the best results.

D. On the management of patients in Group 4 (abnormal obstetrical conditions plus eclamptogenic toxemia):

Some of the more important conditions are:

1. Contracted pelvis of moderate or extreme degree.
2. Heart lesions with decompensation or recently established compensation.
3. Pulmonary disease, severe tuberculosis, pneumothorax, pulmonary edema.
4. Uterine fibroids, especially of the large obstructive type, and if patient is an elderly primipara.
5. Acute infectious diseases such as erysipelas, measles, and scarlet fever.

Each case must be individualized, and in general we may say that the earliest termination of pregnancy compatible with fetal safety, and by the most conservative method is the procedure of choice. With contracted pelvis and disproportion between the size of the baby and the pelvis, we lean toward cesarean section to avoid a long-drawn-out labor, with convulsions present, before its termination. Heart and lung lesions are best treated by cesarean section under local anesthesia for the same reason. If uterine fibroids offer insuperable obstruction, Porro cesarean is probably the best procedure, and if the toxemia is mild and the fibroids do not interfere with decent induction of labor, may solve the problem best. If acute infectious disease is present, avoid delivery if the toxemia is not of the fulminating type; and if it is fulminating do a Porro cesarean section, regardless. The indication for cesarean section in this group may be a double or a triple one. The reason we lean toward the radical side is the uncertainty of the ordinary forces of labor under the abnormal conditions present.

E. On the management of patients in Group 5 (intrapartum eclampsia):

Conservative measure may be tried, or:

1. In primipara, in the first stage of labor, cesarean section should be done unless the first stage can be easily completed, when forceps or version may be substituted. In multipara, dilatation may usually be accomplished by a bag, or manually.
2. In the second stage of labor, forceps or version, adding episiotomy if the patient is a primipara. Morphine grain one-fourth is given after delivery of baby, and one-sixth grain six hours afterward if necessary.

3. Late delivery room set up to avoid contamination.

4. Watch carefully by rectal examination to avoid precipitate delivery.

5. Prepare for asphyxiated baby, tracheal catheter and oxygen.

6. Limit examinations and operations to avoid infections.

7. Careful repair of wounds.

F. On the management of patients in Group 6 (postpartum eclampsia):

(a) All cases of preëclamptic toxemia found before or during labor:

1. Treated prophylactically in puerperium by magnesium sulphate, morning and afternoon by mouth, or 20 cubic centimeters of a 10 per cent solution intravenously.

2. Milk diet and bed rest.

3. Blood pressure three times a day until it stays below 140.

(b) If convulsions:

4. Venesection, 700 to 800 cubic centimeters.

5. Morphine, grains one-fourth or one-sixth, three times a day, if necessary.

6. Chloral hydrate, 20 to 40 grains in 4 to 5 ounces of water, per rectum.

7. Phenolsulphonephthalein test.

8. Protection against injury if convulsions arise. Injury to child or patient due to mental aberration. The danger period is in the first week of the puerperium. Symptoms rarely appear or persist in eclampsia thereafter.

(c) The management of the eclamptic convulsions:

1. Constant attendance of a trained person if possible.

2. Mouth gag to protect the tongue.

3. Sufficient help to prevent self-injury during convulsion.

4. Reduce all stimuli to minimum. Dark room, few examinations, and manipulations. Morphine and chloral are useful.

5. Bleeding is best done by venesection under local anesthesia.

RESULTS

By the application of these principles we have handled two hundred and sixty-five cases of eclamptogenic toxemia with or without convulsions. These have practically all been clinical cases in the charity beds of the University of Iowa and University of Illinois teaching hospitals. While the writer supervised most of the cases personally and did nearly all of the major operative work, the ordinary deliveries and the conduct of the labors were in the hands of his intern and residents. The prenatal supervision was excellent in almost all cases, very few having eluded the vigilance of our out-patient staff. Of these cases we have classified two hundred and twenty-one as eclamptics and forty-three as nephritic toxemias, on the basis of the evidence at hand, six weeks after de-

livery when the case was finally summed up. A concentrated résumé of the findings is given in parts one to seven of the table.

CONCLUSIONS

1. The mortality in eclampsia in the United States registered area is on the increase, in spite of numerous demonstrations in special clinics that the disease can be practically eliminated by efficient management.

2. Considerable evidence points to the fact that protein metabolic end-products play an important part in the etiology.

3. Limiting the production, and promoting the excretion of these substances, will in most instances prevent the development of serious symptoms.

4. When serious symptoms arise, in spite of prophylactic treatment, suggesting the probable onset of the dangerous convulsive stage, the pregnancy should be terminated as conservatively as the exigencies will permit.

5. Cesarean section is advised only in the fulminating type of eclamptogenic toxemia or in the presence of a border-line or actual indication for other causes, such as contracted pelvis, placenta previa, cardiac or pulmonary disease. Cesarean section should never be undertaken in eclampsia without, first, an accurate estimation of the obstetrical problem involved; second, a competent operator familiar with obstetrical operations; and third, proper assistance and surgical surroundings.

6. The eclamptogenic baby is toxic, frequently premature and below par, and careful attention should be given to its delivery, resuscitation and immediate postdelivery management.

7. When serious symptoms arise and operative intervention is contraindicated, the Stroganoff method of treatment is advised, combined with the use of magnesium sulphate intravenously if convulsive seizures supervene.

8. No great general reduction in mortality is to be expected until medical students, practicing physicians, and even the laity, have a clear understanding of these salient underlying principles.

University of Illinois College of Medicine.

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A PRACTICAL CONSIDERATION OF CHOLECYSTOGRAPHY*

By B. R. KIRKLIN, M. D.

Rochester, Minnesota

PUBLISHED statistics on the accuracy of cholecystographic diagnosis vary rather widely. Aside from differences due to the personal equation, the variation may be attributed to: (1) present inability of the surgeon, anatomist, physiologist, and histopathologist to distinguish minutely between the normal and abnormal gall bladder; (2) lack of agreement as to what constitutes the normal or abnormal gall bladder; (3) use or non-use of clinical data in the making of cholecystographic diagnoses; and (4) variations in groups on which the statistics are based and in the methods of analysis.

Disease of the biliary tract is the most common abdominal lesion for which surgeons are called on to operate, and it is, therefore, of prime importance to determine who shall condemn or defend the gall bladder, whether the clinician, surgeon, roentgenologist, or pathologist.⁷ Although the clinician carries the major portion of the responsibility in determining whether the gall bladder should be subjected to surgical exploration, nevertheless he depends on the roentgenologist and surgeon for help and advice, and eventually he appeals to the anatomist, physiologist, and pathologist for fundamental knowledge. The chain of diagnosis of cholecytic disease is, therefore, no stronger than its weakest link.

Cholecystography has brought to the attention of the anatomist the fact that the gall bladder varies greatly in form and position according to the habitus of the individual. Cholecystography also has aided the physiologist in his efforts to ascertain more specifically the functional behavior of the gall bladder and its alteration by nonpathologic states. Mann¹¹ and other physiologists consider the gall bladder to be a rather temperamental organ, susceptible of influence by many remote conditions. The work of Mann and Higgins¹² indicates that a degree of stasis occurs during pregnancy. Boyden¹ concluded from his studies that gall bladders of women empty more quickly than those of men. Plummer,¹³ interested in the subject primarily as a clinician, has observed that a certain type of patient, characterized by being easily fatigued, by achlorhydria and by a low basal metabolic rate, is likely to respond eccentrically to

* From the Section on Roentgenology, The Mayo Clinic, Rochester, Minnesota.

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cholecystography; the shadow is frequently faint or absent, although clinical evidence of cholecystic disease is lacking.

DEFINITION OF CHOLECYSTIC DISEASE

A more precise definition of cholecystic disease is necessary and the pathologist must supply this definition. There is no definite agreement as to just how much of a pathologic condition of the gall bladder is implied by pericholecystic adhesions.⁹ At any rate, such a gall bladder may concentrate dyes normally and, assuming that it is abnormal anatomically, it is questionable whether the abnormality constitutes disease of clinical moment. Definite disease does not always diminish the capacity for concentration of the dye nor, as shown by Kirklin, Caylor and Bollman,¹⁰ is the relation constant between the degree of concentration of bile and that of cholecystographic mediums. The significance of petty anatomic changes, visible only by aid of the microscope, is still debatable. Many times these changes which have been designated as cholecystitis, graded 1, that is, very mild cholecystitis, may represent traces of disease now healed or quiescent; in other instances abnormalities of equal extent are meaningless, and the gall bladder can be listed as normal. On the other hand,⁶ it has been noted that cholecystectomy is of benefit to a large number of patients with cholecystitis, graded 1, who have at any time had definite symptoms suggestive of cholecystitis, whereas those with atypical or slight symptoms derive little benefit from the operation. Obviously, there is a point at which even the microscope fails to distinguish with certainty between the normal and abnormal gall bladder, or at least fails to throw light on the clinical significance of slight departures from the normal. It is noteworthy that since cholecystography has been applied at The Mayo Clinic, the proportion of cases in which only mild cholecystitis was found at operation has steadily declined, whereas the percentage of cases with stones or marked disease of the gall bladder has increased.

Clinicians in general have maintained a most encouraging attitude toward this new method of diagnosis, and the warmest advocates of cholecystography do not have reason to complain of lack of coöperation. Some clinicians³ believe, however, that the responsibility of the final diagnosis should not be assumed by the roentgenologist, nor should any single laboratory test be depended on as infallible for the diagnosis of cholecystic disease, and I am in hearty accord with this belief. When all the facts have been gathered together from all sources, it is the function of the clinician to correlate them and to give each its relative value in the making of the final diagnosis.

EVALUATION OF CHOLECYSTOGRAPHIC DATA

In my own work I prefer to study and evaluate the cholecystographic data without cognizance of the clinical history. Intimate knowledge of the clinical history may assist the roentgenologist to make diagnoses when the cholecystographic data

are scanty or questionable, but such diagnoses are not roentgenologic. It is surprising, since there are such basic defects in the knowledge of the physiology and pathology of the gall bladder, that cholecystographic data are so rarely wrong and that the distinction between normal and abnormal function of the gall bladder, as originally laid down by Graham, Cole and Copher,⁴ has needed so little alteration. Naturally individual examiners vary considerably in the application of these data and conservatism of interpretation. I, for one, am inclined to be more liberal in appraisal of the normal and quite conservative in my judgment of the abnormal, realizing that cholecystography is primarily a test of the dye-concentrating ability of the gall bladder and, excepting in cases of stones, not a means of demonstrating pathologic changes directly.

TECHNIQUE

Several drugs have been employed since Graham's original work, but none has been superior to the sodium salt of tetraiodophenolphthalein. Different observers vary in their opinion as to the relative value of intravenous and oral administration of the drug. Those who are partial to intravenous administration insist that the oral method is unreliable unless the result indicates a normally functioning gall bladder. On the other hand, most examiners are using the oral method. If it is desirable to determine the function of the liver and gall bladder simultaneously, the intravenous administration of sodium phenoltetraiodophthalein is indicated.⁵ Although intravenous administration makes it certain that a full dose has been introduced into the circulation and excludes any question of absorption, the occasional reaction encountered, even in the presence of rigid precautions, makes one hesitate to urge its use as a routine. In view of added responsibility and necessary hospitalization, the intravenous method has the disadvantage of increasing the patient's expense materially.

The oral method is not associated with risks or contraindications, and it lends itself to general employment. It is true that nausea, purging, or vomiting occur occasionally. The most common objections urged against this method are: (1) the patient may fail to take the drug as directed; (2) the dye may be vomited shortly after it is taken; and (3) it may fail to be absorbed adequately or at all by the intestine, thereby producing dense shadows overlying the gall bladder. Experience indicates that none of these objections are significant. In order to check the accuracy of the oral method, I had the dye given intravenously in a large number of cases in which I had failed to obtain a shadow of the gall bladder following the oral administration of the drug; from the results obtained I came to the conclusion that the oral administration of cholecystographic drugs is as reliable as intravenous administration. My experience, as well as that of other observers, shows that the accuracy of the oral method compares

favorably with that reported by partisans of the intravenous technique.

During the last eighteen months I have employed sodium tetraiodophenolphthalein in aqueous solution. The patient receives 4 grams of the drug dissolved in 30 cubic centimeters of distilled water, and is instructed to add it to a glassful of grape juice and take it immediately following his evening meal. He is instructed to take the usual quantity of food for his evening meal, but to eliminate fats. It has been my experience that better results are thus obtained than when a light evening meal is taken. Roentgenograms are made at the fourteenth, sixteenth, and twentieth hours. The taking of food is prohibited until after the sixteenth-hour roentgenograms are made, at which time a fatty meal, consisting of a glass of half cream and half milk, with other food, is taken. Usually this meal has the effect of only partially emptying the gall bladder at the twentieth hour and may make possible the discovery of stones at this period, whereas egg-yolk, which is commonly used, evacuates the viscus completely. Since the use of the technique described, nausea has rarely followed, and clumps of unabsorbed dye are less frequently noted in the bowel. The technique appears to excel any yet proposed for oral administration.

INTERPRETATION

In view of the fact that cholecystography is a test of the concentrating ability of the gall bladder, it is obvious that the most difficult item of interpretation is the determination of what constitutes normal density of the cystic shadow. Density varies not only with the drug employed and the quantity prescribed, but has a considerable range of variance under comparable conditions, and the personal equation inevitably influences judgment. It varies at the different periods, but the shadow usually is denser at the sixteenth hour than at the fourteenth; at the twentieth hour, a fatty meal having been taken in the meantime, the shadow most often will have been reduced to about half the size shown at the sixteenth-hour examination, although it may disappear entirely. The sequence, however, is not inflexible, and the shadow may be most dense at any one of the three periods. As a rule, the shadow will be slightly larger at the second period than at the first, although the reverse is sometimes true; here again the sequence is less important than the fact of changing size which is an indication of elasticity of the wall of the gall bladder. In persons of asthenic habitus the gall bladder is likely to be long, slender, or even pointed; in those of sthenic or hypersthenic habitus it is usually short and rounded, but exceptions are numerous, and the general form is without significance. Its normal position is widely variable and it may be seated high or low, mesially or laterally, without meaning. In the slender patient it usually lies low and mesially, whereas in those of the broad habitus it is most often situated high and laterally. The shadow should be homogeneous in the sense of not having persistent thin areas or dense spots. On the whole, and with few exceptions, judgment

should be based not on its worst, but on its best appearance at any stage of the examination.

There still exists some difference of opinion as to the value of the various signs of disease, and summarization of the general opinion would be difficult. Some observers stress the importance of deformities of the contour of the shadow of the gall bladder as indicating adhesions, whereas others are more liberal in their appraisal of the faint shadow. I shall emphasize only those signs which I have found reliable. Assuming that any lapse of technique can be excluded, the reliable indications of cholecystic disease comprise only three varieties of abnormality in the shadow of the gall bladder: (1) absence of any shadow; (2) persistent faintness of the shadow; and (3) mottling of the shadow. Although absence of a shadow may be the result of failure of the dye to be absorbed by the intestine, or occasionally from extensive disease of the liver, experience has shown such causes to be rare, and this negative sign can be construed consistently as an index of disordered function. I would insist strongly on the necessity for caution in pronouncing a shadow to be faint, for normal concentration has a wide latitude, and only a shadow which is scarcely visible at all periods can safely be considered faint. Mottling of the shadow, either by denser spots or translucent areas, is indicative of stones when superimposed gas, calcified lymph nodes, and ossification of the costal cartilages or transverse processes can be barred. A shadow of the gall bladder that remains fixed in size and density throughout is suggestive of a shadow produced by a diseased gall bladder without the assistance of dye, and such a patient should be reexamined without the dye.

Irregularities of contour have been of little, if any, significance in my experience and seldom denote intrinsic disease. Gall bladders buried in adhesions will cast shadows with perfectly smooth contours; on the other hand, an irregular contour will appear in an otherwise normal cholecystogram, when the gall bladder is found at operation to be free from adhesions or deformity. Marked serration of the border, with the shadow fixed in position and in the same situation at all periods, has been seen occasionally in cases with dense adhesions, and a single band of adhesions may produce an incisura with hourglass deformity of the gall bladder. As the function of concentration is preserved, the gravity of the condition is doubtful, and its cholecystographic manifestation is rare, for in most instances adhesions, however dense, do not cause deformity of contour. Angulation at the neck of the gall bladder does not have pathologic import. The size of the normal gall bladder varies considerably during fasting. Although further experience may prove that delayed filling and its opposite, retarded emptying, are indicative of disease, I have not yet been able to attach significance to either alone.

Since cholecystography is preëminently a test of the ability of the gall bladder to receive and con-

centrate dye-laden bile, and since this capacity does not have a constant relation to health or disease, it would seem that the roentgenologist's report to the clinician should be in terms of function only, rather than of anatomic condition. Accordingly, at The Mayo Clinic reports are made in one of three forms: (1) normally functioning gall bladder, (2) poorly functioning gall bladder (when the shadow is persistently faint), and (3) nonfunctioning gall bladder (when a shadow of the viscus is not seen). Evidence of stones may be associated with any of the three types, and is so reported.

ACCURACY

Cholecystography at The Mayo Clinic has increased progressively in accuracy during the last four years.⁸ During that time 25,191 examinations were made and 3517 patients operated on. During the last two years the general accuracy of all cholecystographic diagnoses has been 90 per cent. In 97 per cent of the group of cases in which gall stones were found at operation the cholecystograms indicated a poorly functioning or nonfunctioning gall bladder. In only 40 per cent were gall stones manifest as dense or translucent areas and diagnosed as stones. Of the cases in which the gall bladder was diseased but did not contain stones there was evidence of disturbed function in approximately 80 per cent, whereas in 20 per cent the gall bladder was apparently deporting itself normally. Among the cases in which the gall bladder was pronounced normal by the surgeon and by the pathologist, cholecystograms indicated a normal condition in 90 per cent.

To analyze the cases from the standpoint of the various types of roentgenologic data, the series may be divided into four groups: (1) nonfunctioning gall bladder with and without stones, (2) poorly functioning gall bladder with and without stones, (3) normally functioning gall bladder with stones, and (4) normally functioning gall bladder without stones.

In 77 per cent of the first group the diseased gall bladder was found to contain stones at operation; in 18 per cent the gall bladder was diseased, but did not contain stones, and in 5 per cent the gall bladder was considered to be normal by the surgeon or by the pathologist or by both. In short, in 95 per cent of the cases of nonfunctioning gall bladder the diagnosis was confirmed at operation.

In 74 per cent of the second group cholecyctic disease with stones was found at operation; in 20 per cent definite disease of the gall bladder was present without stones, and in 6 per cent the gall bladder was normal. The total accuracy of diagnosis in this group was 94 per cent.

In all the cases in the third group, in which the interpretation was that the gall bladder was normally functioning and contained stones, the diagnoses were confirmed at operation.

It is in the fourth group, in which a normally functioning gall bladder was reported, that the

highest percentage of error occurred. At operation, cholecystography was found to be in error in 18.5 per cent of the cases. In a few cases stones were found. That the cholecystogram indicative of normal conditions should be relatively less reliable than the one indicating abnormal conditions is contrary to general expectation. It is compatible, however, with the work of Caylor and Bollman,² who have shown that the function of concentrating bile may be preserved or even enhanced despite advanced disease of the gall bladder. They have shown that in certain types of cholecyctic disease the entire organ is not necessarily involved; there may be hyperfunctioning areas, impaired areas, and normal areas.

SUMMARY

In retrospect, the history of cholecystography is brilliant. It is remarkable in that it has not undergone essential changes during its five years of existence. Even more remarkable is the high efficiency which it attained at the outset and which it has held without remission. Whatever progress it may make in the future will depend primarily on general expansion of knowledge regarding the physiology and pathology of the biliary tract; and it even offers a method by which some of this knowledge can be gained.

The Mayo Clinic.

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MASKED OTITIS MEDIA AND MASTOIDITIS IN INFANCY*

REPORT OF CASES

By EDWARD S. BABCOCK, M. D.

AND

J. ROY JONES, M. D.

Sacramento

BY masked otitis media or mastoiditis is meant an infection of the middle ear, or mastoid with symptoms referable to some distant part of the body. The local signs are usually absent or differ from those ordinarily found.

FREQUENCY

Over thirty-five years ago European investigators reported finding a purulent inflammation of the middle ear at autopsy in about four-fifths of all dead nurslings, and its frequency, in association with intestinal disturbances, was noted. It was thought that this type of otitis found in cachectic infants was due to lowered resistance and was purely latent or concomitant. These terms have existed in the textbooks up to the present time.

The frequency with which otitis media is found in infancy makes it imperative that the ear-drums be examined regularly without regard to indicative symptomatology. Fortunately this is realized at the present time by most practitioners, and acute otitis is recognized early by the red, bulging drum. The ear-drum of masked otitis and mastoiditis is seldom red, and there is often little or no bulging. Spontaneous perforation is rare. Postauricular swelling, redness, and tenderness do not occur. However, there is always some discernible change in the drum or canal wall when carefully examined. This examination is at times difficult, as the external canals in infants often are very small and may be filled with debris, such as wax, soured milk, and desquamation. This debris must all be removed with small curettes, swabs or other suitable instruments, as irrigation seldom will remove it. Care must be taken not to irritate the surface of the drum, as irritation may simulate the appearance of infection. It is impossible to examine some of these drums through a speculum with an opening larger than three millimeters in diameter. If walled-off pus is in the mastoid antrum, there is usually a sag of the posterior canal wall adjacent to the drum, and the drum has lost its normal luster. There is no cone of light. The color is more often dull gray or creamy white than dull red or pink. It must be remembered that the normal drum of the newborn in the first few days or weeks may have a similar appearance. Alden,¹ after examining a large number of these ears, said: "We soon found that with the electric otoscope, with brilliant illumination and some magnification, we were able to see cer-

tain signs of middle-ear disease which with the head mirror and reflected light we had previously overlooked."

CAUSAL RELATIONSHIPS

In the last few years, many articles have appeared in the literature regarding these infections. Most of this work has been done on babies in whom the otitis was associated with severe gastrointestinal disturbance, *i. e.*, athrepsia, anhydremia. The question naturally arises as to whether the ear infection is the cause of the diarrhea or the diarrhea the cause of the ear infection, or at times whether both are caused by a common nasopharyngeal infection. It is probable that most of these infections of the middle ear and mastoid are the result of bacterial invasion from the nasopharynx through the eustachian tube, although it has apparently been proven that some are intestinal in origin, as organisms of the intestinal group have been found in cultures from both the blood and mastoid.² Marriott³ in 1925 suggested that in severe anhydremia a streptococcus toxin is liberated which has a specific action on the capillaries of the body, especially of the intestinal tract. Since all cases are not streptococcal we must assume the probability of other bacterial toxins as well as those of the streptococcus. The possible absorption of certain toxic amines, such as histamin and tyramin, has aroused some comment and research. It must also be borne in mind that a severe enteritis may exist with no distant focus of infection. These questions probably will be fully worked out in the future. Regardless of theory it has now been proven without doubt that early surgical drainage of the focus of infection, when present, together with proper medical treatment will save most of these otherwise moribund infants.

Aside from the enteritis cases we have found many symptoms of these ear infections referable to the various systems of the body. Cough, snuffles, anorexia, vomiting without intestinal disturbance, fretfulness, convulsions, paralyzes and extreme toxicity have been repeatedly seen, which cleared after drainage of the middle ear or mastoid. While there is usually some elevation of temperature and increase in the white blood count, these may be normal. From our experience in private practice we feel that this heterogeneous group deserves far more attention in relation to the enteritis group than it has been accorded, and that these cases are too often overlooked.

The eustachian tube of the infant is relatively short, horizontal and large, compared with that of older children and adults. Alden⁴ gives this as the reason why the ear-drum so frequently is not bulging when paracentesis reveals pus in the tympanic cavity, as there is free drainage into the nasopharynx. This drainage also explains the frequent occurrence of cough or snuffles, which we have found with no demonstrable pathology except the otitis. Whether the other symptoms men-

* Chairman's address, Pediatrics Section, Fifty-Eighth Annual Session of the California Medical Association, May 6-9, 1929.

tioned are all toxic effects or whether there are other explanations, cannot be said at the present time.

TREATMENT

The treatment of these cases is both medical and surgical, and the otologist and the pediatrician must work in closest harmony. The opening of a questionable ear-drum does no damage; if there is any question as to the presence of infection in the middle ear, a diagnostic paracentesis should be performed. In those cases with resultant drainage and definite improvement in the condition of the patient further surgical procedure is unnecessary. The incision tends to heal before infection has subsided, and it is sometimes necessary to incise the drum every few days to maintain drainage.

The mucosa of the attic, aditus, and antrum in the infant is yet embryonic in type and, when infected, swells sufficiently to separate them entirely from the middle-ear cavity. When this separation is complete, antrotomy is necessary, as the antrum cannot drain, in spite of free drainage from the middle ear. When is operation indicated clinically? First, in the very toxic cases with sudden dehydration and collapse, no time should be wasted in opening the antrum, regardless of free drainage from paracentesis of the drum, as this type of infant may die in only a few hours or days. Second, in those infants who show definite or suggestive signs of mastoid involvement, as dull or dirty gray tympanic membranes and sag of posterior canal walls, in whom there is no middle-ear drainage after paracentesis, antrotomy should also be done without temporizing, as severe toxic symptoms may appear unheralded very rapidly, followed by sudden death. Third, in those cases of purulent otitis with minor symptoms, such as cough or failure to gain weight, in whom repeated paracentesis fail to cause improvement, antrotomy is indicated. Only experience and good clinical judgment can help to decide when operative interference is indicated in some cases of this group. We have seen the ear return to normal and symptoms disappear after paracenteses, repeated every few days over a period of six to eight weeks. However, it is probably safer to establish antrum drainage much earlier than this, as there is not only the danger of sudden toxic effects, but also of meningitis, even though we be dealing with a very low grade type of infection. Operation should be performed, of course, only after all possible sources of infection which might cause the symptoms have been eliminated, or at least only after a sincere endeavor to eliminate them has been made.

Renaud⁶ in 1921 reported ten cases on whom mastoid antrotomies were performed, with nine deaths. Lyman and Alden⁶ had eight recoveries and seven deaths out of their first series, and only eight deaths out of forty-three cases in a later series. Other reports show a similar decreasing

mortality. This lowered mortality is accounted for by two factors: First, the infants receive operation before they are *in extremis*, as formerly; and, second, the operation is much simpler and shorter. The technique of antrotomy varies with the individual surgeon. Either a local anesthetic or as short a general anesthesia as is necessary for establishing the proper antral cell drainage is indicated. Alden¹ advocates local novocain anesthesia with careful curettage of all granulations from the antral cell. Canuyt⁷ reports operating on twenty-seven infants with no fatalities, using ethyl chlorid local anesthesia, and making a simple opening into the antrum without curettage. Older infants who have developed more mastoid cells necessarily require more than this simple antrotomy. Nitrous oxid and oxygen has been tolerated very well in the few cases in which it has been used and has the advantages of general anesthesia.

The medical treatment cannot be so concisely outlined as the surgical, as this of course will depend on the type of symptomatology. Suitable feeding with concentrated high calorie formulas must be given to those failing to gain weight. Thick cereal feedings often help the vomiters, and high calorie formulas, which leave little residue in the bowel (this precludes milk), are helpful when diarrhea is present. Symptomatic treatment of convulsions, insomnia, cough, etc., is indicated when these are present. In the athreptic group with diarrhea, dehydration, and acidosis, the administration of parenteral fluids is of paramount importance. Recent studies⁸ on the acid-base equilibrium of the blood plasma and the retention of phosphoric acid and nonprotein nitrogen in these infants show that glucose and sodium bicarbonate solution must be given as long as diarrhea, vomiting, dehydration, and acidosis persist. According to Hartman the administration of large amounts of saline solution is contraindicated, due to the production of acidosis. In preparing the glucose and sodium bicarbonate solution, chemically pure sterile triple distilled water is used. The glucose is dry-sterilized before going into solution. The sodium bicarbonate solution is made under reduced oxygen tension and tested for sodium carbonate content before use. Ampoules of the concentrated solutions are on the market which can be diluted when ready for use. It is important that these be not boiled in heating, as the bicarbonate is broken down to carbonate and the glucose caramelizes. The intravenous, intraperitoneal and subcutaneous routes are all employed, as well as the oral, when large amounts of fluid are required. Two and a half per cent glucose solution is usually given subcutaneously, and five per cent given intraperitoneally and intravenously, one-fourth to one-half of one per cent sodium bicarbonate being in the same solution. Three hundred to one thousand cubic centimeters may be given daily parenterally, depending upon the needs of the case and on the amount retained by mouth. In the more chronic types of infec-

tions small blood transfusions repeated every few days, ultra-violet light, and vaccines are often of the greatest importance.

REPORT OF CASES

CASE 1.—C. S., female, age eleven months. Had a history of slight cough and running nose for six weeks with no other symptoms. She then became doxy and irritable, and the temperature rose to 103 degrees for two days. This was followed by generalized convulsions, most marked on the left side of the body. The fontanelle was slightly bulging. The right pupil was dilated. Ear-drums were both about normal color, but had poor sheen and bulged slightly. Flaccid paralysis of right leg and left arm with absent tendon reflexes. Normal muscle tone and reflexes of right arm and left leg. A bilateral myringotomy was performed with resultant drainage from ears. The cerebrospinal fluid was negative except for increased pressure. After two days the paralysis had entirely disappeared and the temperature remained normal.

CASE 2.—T. O., male, age seventeen months. Entered hospital January 15. There had been severe diarrhea for six days. The child was markedly dehydrated and toxic and appeared moribund. The throat was red. The left ear-drum was normal. The right ear-drum was normal except for a few injected vessels in the posterior superior quadrant. Urine showed albumin, casts, and blood cells. White blood count was 25,000. Glucose and sodium bicarbonate solution were given parenterally daily, with very slight, if any, improvement. On January 18 the right ear-drum was slightly bulging posteriorly. The left was pink in the posterior superior quadrant. Bilateral myringotomy showed considerable mucopus in the right, and very little in the left ear. On January 21 there was no improvement. White blood cells numbered 39,500. Bilateral mastoidectomy showed the right antrum filled with pus debris, and necrosis of lining tissue. Culture showed pneumococcus. Mucopus from the left antrum was sterile when cultured. On January 23 child was markedly improved and moved arms and legs for the first time since entering hospital. White blood cells numbered 5000. Slight decrease shown in number of stools. On February 18 patient was dismissed. Stools, blood, and urine were normal. Child acted normally.

CASE 3.—G. L., male, age three months. This child had fretted and moaned as if in pain since shortly after birth. The parents said this became aggravated and was accompanied by high fever for four or five days before examination was made. There were no other symptoms and the babe had consistently gained in weight until fever set in in the last few days. Examination showed early dehydration and a very toxic-appearing infant. The ear-drums were pale, but dull. There was no bulging. The posterior superior canal wall adjacent to the drum was slightly sagging. Physical examination was otherwise negative. The urine showed albumin, casts, and some blood cells. White blood cells numbered 11,000, with 73 per cent polymorphonuclear leukocytes. Temperature was 104 degrees. X-rays of head, chest, and long bones were negative. Intradermal tuberculin and blood Wassermann tests were negative. Paracentesis of ear-drums revealed no pus in middle ears. The temperature rose rapidly, the child became cyanotic and expired. Autopsy revealed pure creamy pus in both mastoid antra. No other pathology found.

CASE 4.—R. DeJ., male, age thirteen days. A "cold in the head," with snuffles, was noticed when the baby was two or three days old, which persisted. On the eleventh day vomiting and diarrhea commenced. On

the twelfth day, when he was first examined, he showed signs of moderate dehydration, toxicity, and bilateral otitis only. Bilateral myringotomy was followed by free drainage. The condition of the patient seemed to warrant conservative treatment and antrotomy was delayed. When seen the next morning he was the picture of terminal athrepsia. He was given more fluids, but expired before antrotomy could be performed. Autopsy disclosed both mastoid antra full of pus.

CASE 5.—J. C., male, age eight weeks. History of "cold in head and chest" for two weeks, accompanied by vomiting and rather loose stools. Weight seven and one-half pounds. Nutrition was rather poor. There was generalized infection of the upper respiratory tract and bilateral otitis media. The temperature remained normal. White blood cells numbered 10,600, with 31 per cent polymorphonuclear leukocytes. Urine was negative; x-ray of chest, negative. After bilateral myringotomy there was improvement in the cough and vomiting. Six paracenteses had to be performed in the next two weeks to maintain drainage. The improvement after the first few paracenteses was only temporary, and from then on the child's condition remained stationary, so that after two weeks of this conservative treatment a bilateral antrotomy was performed. Mucopus was found in both antra although cultures were sterile. There was no vomiting after the day of the operation, and the child was dismissed in fourteen days, weighing over nine pounds and in normal health.

SUMMARY

The paper deals with the type of infantile otitis media and mastoiditis wherein the ear infection is masked, as the symptoms are referable to some distant part of the body.

The ear-drum is more often dull gray or creamy white, with little or no bulging, than it is red and bulging. With walled-off pus in the mastoid antrum there is usually a sag of the posterior superior canal wall adjacent to the drum. These drums are best seen with an electric otoscope and small speculum.

Many moribund infants, especially those with severe gastro-intestinal or nutritional disturbances, can be saved by drainage of the focus of infection in the ear.

Aside from the enteritis, cough, anorexia, snuffles, vomiting, fretfulness, convulsions, extreme toxicity, and occasionally paralyses are among the symptoms which may be due to hidden ear infection. Fever and leukocytosis may be absent.

Repeated myringotomies may be necessary to maintain middle-ear drainage. Mastoid antrotomy is indicated (1) when repeated myringotomies for purulent otitis fail to cause improvement, (2) when the infant is markedly toxic in spite of free middle ear drainage, and (3) in the toxic infant when the ear examination suggests infection although myringotomy reveals no pus in the middle ear.

In the athreptic group with diarrhea, acidosis, and dehydration, glucose and sodium bicarbonate solution should be given parenterally, according to the needs of the individual and the amount of fluid retained by mouth. The feeding and symp-

tomatic treatment will vary with the type of case at hand.

Several selected cases seen in private practice are reported to illustrate varying types of symptomatology.

820 Medico-Dental Building.
508 California State Life Building.

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UTERINE FIBROIDS*

FUNDAMENTALS IN THE APPLICATION OF ROENTGEN RAYS

By FRED LINDENBERG, M. D.
Los Angeles

DISCUSSION by Frank W. Lynch, M. D., San Francisco;
William H. Sargent, M. D., Oakland; H. J. Ullmann,
M. D., Santa Barbara.

ROENTGEN-RAY therapy of fibromyomata, in spite of many excellent results, has met with a great deal of adverse criticism by a large part of the medical profession. As with many other new therapeutic agents, the pendulum has swung from the heights of early enthusiasm to the depths of disappointment. The viewpoints of the radiologist and the surgeon are usually so contradictory that the general practitioner is confused as to what is the best and most rational treatment for patients with fibroid pathology.

It is the writer's viewpoint that radiologic methods of therapy, from the standpoints of safety, painlessness and economy, offer many advantages over operative methods.

Many surgeons who, at its first introduction, gave radiologic methods an impartial consideration have become prejudiced against it. There were too many failures among the radiated cases, and increased difficulties in surgical procedures were encountered after such therapy.

One of the main causes of failures in the experimental stage of roentgen therapy was the

assumption that the fibroid, as such, was amenable to x-rays.

These failures restricted the use of x-ray therapy to certain types of tumors. Because fibromyomata do not represent a uniform pathology and differ regarding their seat and their degenerative changes, it was found that the treatment should vary accordingly. The massive dose at first used was reduced to a castration dose, directed, as the name implies, against the ovaries.

Gynecologic clinics which have the roentgen armamentarium under their direct command, and which can, therefore, be unbiased in their choice of a therapeutic agent, have in the course of time and experience worked out the indications and technique for the roentgen therapy of fibroid tumors. It is the writer's opinion that such clinics quite uniformly agree that in properly selected cases, which amount to about 15 to 30 per cent of all fibromyomata, roentgen ray therapy offers an ideal therapeutic agent.

The results which have been recorded since adherence to the strict indications have been excellent. In this connection some statistics of several of the larger gynecological hospitals may be quoted: *A. Freund*—175 patients, 2 per cent failures; *Stager*—121 cases, 6 per cent failures; *E. Zweifel*—222 cases, 2 per cent failures; *Vogt*—1300 cases, 1 per cent failures; *Martindale*—5 per cent failures; *Stoeckel*—nearly 100 per cent successful.

This paper aims particularly to present the contraindications and indications of roentgen-ray therapy in the treatment of fibroid tumors.

EFFECT OF ROENTGEN RAYS ON THE TUMOR

Before the subject is discussed in detail, the manner in which the rays effect the shrinking of the uterine fibroid may be considered.

Beclère and others maintain that the rays cause, by stimulation of the tumor itself, a proliferation of the endothelium of the small vessels, followed by an obliteration of the blood supply of the tumor, thus shrinking the fibroid mass. In spite of many discussions in the literature, there is no positive proof that a castration dose of x-ray radiations affects the fibroid cells *per se*. All pathologists agree, however, that their action notably depends on their destructive influence on the ovaries—on castration.

If the follicles are destroyed and their function annihilated, the hemorrhages stop and the fibroid shrinks or disappears. In this same manner nature often brings about a cure of interstitial fibroids after the menopause. It follows, then, that, in order to treat fibroids successfully by roentgen ray, we must radiate to the point of amenorrhea, that is, we must give a castration dose.

GENERAL CONTRAINDICATIONS

These include: (a) Young women; (b) Women who wish to bear children; and (c) Nervous women.

(a) Younger women in whom we wish to preserve ovarian function should not be radiated. Such younger patients show better results from

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myomectomy or hysterectomy. Surgical interference in which the ovaries can be preserved is doubtlessly a lesser insult than a climacterium praecox with its intense disturbances. The age limit must be determined by, and be left to the judgment of the physician.

(b) Women who wish to have children, for the same reason, should be excluded from radiation therapy.

(c) Very nervous women are more benefited by operation with preservation of the ovarian function; because in such patients the sudden exclusion of the ovarian hormone often aggravates the unbalanced nervous system.

SPECIFIC CONTRAINDICATIONS

In dealing with any abdominal tumor, difficulties are often encountered in ascertaining the right diagnosis. There is scarcely a more dangerous agent in the whole field of medical therapy, and one which can raise more havoc than roentgen rays, if improperly applied. It is, therefore, important to discuss under specific contraindications some of such conditions:

1. *Mistaken Fibroids.*—Such growths which are at times radiated include: (a) pregnant uterus; (b) ovarian tumors; (c) pyosalpinx.

(a) *Pregnant Uterus.*—Patients of this type who consult their physician are ordinarily near, or well in the climacteric age. They give a history of distinct signs of climacteric disturbances with prolonged menstrual intervals, or climacteric amenorrhea. The differential diagnostic possibilities of such cases may tax the judgment of the gynecologist to the utmost. There is no excuse, however, for having such patients radiated. A pregnant woman is characterized by her amenorrhea, or at times by irregular bleeding, symptoms which are absolute contraindications for radiation.

Fibroids which are not bleeding, if they need any therapy at all, should be dealt with only surgically. If a tumor grows as fast as a pregnant uterus, we have doubtlessly to deal with a severe malignancy. Such a condition demands other methods of treatment.

More conceivable is the radiation of a fibroid tumor complicating pregnancy. In such patients, with the increased circulation of pregnancy, a rapid growth of the fibroid calls for attention.

The consequences of radiation of pregnant uteri are tragic. Peculiarly, pregnancy not only goes on in most cases, but women go past term. If irradiation was given in the first months of pregnancy serious fetal injury, such as monsters, are the rule. If given after the third month, the fetus when delivered is very small and delicate, with an underdevelopment of the subcutaneous tissue. The loose and yellowish discoloration of the skin gives the fetus a senile expression. Mental deficiency is almost certain to develop in later years. As soon as the mistaken diagnosis is recognized the induction of a therapeutic abortion is an absolutely imperative procedure.

(b) *Ovarian Tumors.*—An ovarian tumor, especially of malignant pathology, is usually hard and intimately attached to the uterine body, thus

simulating a fibroid mass. While it may be impossible to distinguish the nature of such pathology by bi-manual examination, these tumors are especially characterized by irregular hemorrhages. Tumors with bleeding of a metrorrhagic type should always be excluded from roentgen-ray therapy.

(c) *Pyosalpinx.*—These tumors, if attached to the uterus, may simulate fibromyomata. The history of such patients will usually give us a hint as to the inflammatory character of the mass. The damage of radiation in these patients is usually not serious. In some cases, especially if due to gonorrheal infection, the symptoms may even diminish with the amenorrhea after castration.

2. *Certain Types of Fibroids.*—Here may be included: (a) Degenerated fibroids; (b) Submucous fibroids; (c) Large fibroids; (d) Fibroids with malignant degeneration.

(a) *Degenerated Fibroids.*—In such cases our endeavor should be to remove the pus and to eliminate the danger of sepsis and peritonitis. Operation is, therefore, imperative.

(b) *Submucous Fibroids.*—The bleeding in this type of tumor is not only caused by the ovarian function, but also mechanically by an erosion of the overstretched thin-walled veins in the endometrium. The type of bleeding is mostly irregular (metrorrhagic). Radiation of such tumors is not only without success, but, if the tumor is big and the intensive dose is applied by the radiologist, the life of the patient is, at times, endangered; for radiation of such tumors causes an involution of the uterus, and obliteration of the blood supply, and possibly a necrosis of the tumor. Apart from the metrorrhagic type of bleeding, other symptoms and signs, such as cramp-like pains, a short or gaping cervix, will help to clear the diagnosis of submucous fibroids. The consistency of these tumors is rather elastic; enlargement is uniform, not with an irregular and nodular surface.

(c) *Large Myomata.*—Tumors of the size of over five months' pregnancy and those which cause pressure symptoms on the neighboring organs, especially bladder and rectum, are here in mind. It is not so much the size of the tumor, but the fact that it would take several months to bring about adequate shrinking, that will often make a hysterectomy the treatment of choice.

Pressure symptoms on the bladder may be worthy of special comment. In the patient giving symptoms of tenesmus and frequency, the fibroid must have considerable size or must be developed cervically. Repeatedly patients have come under observation with fibroids the size of a fist and smaller, complaining of these urinary afflictions. Such complaints cannot possibly be due to pressure from such small tumors, but are hormonal disturbances (climacteric bladder symptoms).

Real pressure symptoms, such as dribbling and frequency, manifest themselves in a different way. At first such symptoms are recognized by the patient at intervals during menstruations, when hyperemia is causing a swelling of the fibroid

tumor. As the tumor assumes a greater size, these phenomena become constant.

(d) *Malignant Degeneration of Fibroids—Examples of Such, as Carcinoma and Sarcoma.*—Such coincidences are not rare. Statistics show a great number of such cases, especially in nullipara and in virgins at the end of the fourth decade.

The carcinoma is characterized by its metrorrhagic type of bleeding, its fresh-colored blood, and foul-smelling discharge. If such procedure is necessary or advisable, an exploratory curettement and microscopic examination will ascertain the diagnosis.

The diagnosis of sarcoma is at times much more difficult. For the sarcomata often do not bleed at all. A rapid growth, years after climacteric amenorrhea, is pathognomonic of sarcoma. A fibroid grows only as long as the ovaries are functioning. With the change of life a fibroid either retains its size or retrogresses.

If surgery should be deemed not advisable in such cases, heavy dosage of x-ray in combination with radium might be used as a palliative treatment.

INDICATIONS FOR ROENTGEN-RAY THERAPY

Gynecologic clinics, especially in Europe, which have their own roentgen units show in their statistics the employment of x-rays for 15 to 30 per cent of all fibroids.

The gynecological indications for x-ray therapy of fibroid tumors can, indeed, be summarized with one simple sentence. Only those correctly diagnosed and uncomplicated fibroids with menorrhagic disturbances, that is, with increased menstrual bleedings are suitable for x-ray therapy. Those fibroids which consist wholly or overwhelmingly of the interstitial type will comply with these requirements. This therapeutic agent should not be used on tumors of amenorrhagic or metrorrhagic types.

COMMENT

The writer does not wish to say that, at times, border-line cases should not be radiated. Such patients are sometimes radiated with excellent results. The more the strict indications are observed the better will be the percentage of cures. The writer has had four patients with fibroids of mixed types reaching the umbilicus who refused operation, in whom the fibroids shrunk considerably; and five patients with slight inflammatory changes which can be registered as cured. Roentgen-ray therapy, in such cases, should be the exception, not the rule, and the uncertainty of its success should be emphasized.

In such pathologic growths for which, empirically, it is known that not even the slightest degree of improvement may be expected, radiation should never be attempted.

It is important to stress that constitutional or systemic contraindications for surgery in the fibroid patient cannot possibly make the fibroid more eligible for roentgen therapy.

In the writer's opinion the refusal to radiate unsuitable and doubtful fibroid cases will improve

the statistics of cures to almost 100 per cent. In fact, if the indications are right, there are no failures and no untoward results. A competent gynecologist should be responsible for diagnosing the fibroid pathology. The choice of the method of treatment will then be decided upon without difficulty.

TECHNIQUE

A high voltage x-ray apparatus furnishing about 200 kv., and a thorough knowledge of physical and biologic factors, especially erythema and percentage depth dose, are basic requirements.

In order to destroy the generative organs a dose of only 34 per cent is necessary. This castration dose is so small, about one-third of the erythema dose, that no other human tissue can possibly be damaged by it.

This technique represents a great advantage over the massive dose, which renders tissue extremely hard and brittle, making surgical interference, if necessary later, very difficult. In the vast majority of cases, if this light radiation fails, a heavy dose will fail also.

Castration requires, with proper apparatus and technique, little more than two hours, and can be given with one treatment if necessary. The writer prefers, however, to give half a castration dose over each ovary, abdominal and dorsal, on four consecutive days.

EFFECTS

Nausea.—In dividing radiation treatment over a number of days, there is scarcely any discomfort or nausea.

Amenorrhea.—How long it will take before amenorrhea is brought about will depend largely upon the time of intermenstruum, when radiation is given. If treatment took place in the first half, about 60 per cent of the writer's patients would have no more menstruation; but if radiated in the latter half, 95 per cent had one or more bleedings. The explanation of this is that ovulation, causing the following menstruation, takes place about the middle of the intermenstruum. Radiation after ovulation can, therefore, have no effect upon the following menstruation.

Temporary Amenorrhea (Temporary Castration).—By giving about 5 per cent less than the castration dose it is possible, in most cases, to produce a temporary amenorrhea. This is because the immature follicles are less sensitive to radiation. They recover within a few months.

Climacteric Disturbances.—These can readily be controlled with ovarian and pituitary extract. In more severe symptoms calcium intravenously is advisable. It is especially the obese patients who will have more precipitated disturbances. This, however, is not the fault of radiation, but is due to their unbalanced endocrine system (autonomic imbalance). These patients are of hypopituitary and hypothyroid type, with high blood pressure, which makes them especially poor risks for surgery. They always have severe disturbances even

if not treated at all. Short radiation over the pituitary glands, as advocated by the Vienna school, has given me very satisfactory results.

RESULTS

Fifty-nine patients were radiated; forty-four were refused radiation.

Retrogression of Tumors.—In eighteen patients, or 30 per cent, the fibroid shrank totally. In one of these patients a coexisting exophthalmic goiter disappeared after amenorrhea set in.* In twenty-three patients, or 39 per cent, the tumors shrank to more than half their former size. In eleven patients it shrank about one-third its original size. In 5 per cent of patients with fibroids the writer could not notice any diminution, though with the beginning of amenorrhea these patients are feeling well.

Failures.—One rather large fibroid in a patient was shrunk considerably and amenorrhea produced, but adhesions to the omentum made hysterectomy necessary. In another fibroid patient the author could not produce total amenorrhea. Hysterectomy revealed a submucous fibroid near the cervix, besides some small interstitial fibroids. This woman had slight cramp-like pain, and the writer should not have been persuaded to radiate this case.

CONCLUSIONS

1. Roentgen-ray therapy of fibromyomata yields most excellent results in the interstitial and uncomplicated type of fibroids in which the main symptom is excessive monthly bleeding. That group includes about 25 per cent of all fibroids.
2. The fibroid pathology *per se*, uninfluenced by any associated systemic diseases, determines the indication for x-ray therapy.
3. A rather mild radiation, the castration dose, is sufficient to produce an amenorrhea and a cure of the patient.
4. If the diagnosis is correct, success is 100 per cent with no untoward results whatever.
5. Cases of uncertain pathology should preferably receive surgical therapy.
6. The indication should always be made by a competent gynecologist.

1244 Roosevelt Building.

DISCUSSION

FRANK W. LYNCH, M. D. (University of California Hospital, San Francisco).—Doctor Lindenberg, in a well balanced and carefully prepared paper, discusses the indications and contraindications for the roentgen-ray treatment of uterine fibromyoma. He clearly states that not all uterine fibroids demand treatment, and that if treatment is needed that there are at least two methods whose usefulness has been demonstrated, i. e., surgery and the roentgen ray. The third method of treatment, that by radium, is not discussed in the paper.

In spite of the fact that all well-trained men realize the postulates stated above, the fibroid question re-

mains complicated because the medical literature is constantly flooded with papers which urge one form of treatment alone to the exclusion of the others, and which do not give proper statements concerning the complications and disagreeable sequelae of the methods which are so strongly championed. As a result the medical practitioner who does not operate but who does control the patient is confused: he sends her, according to his lights, either to surgeons who only operate, or to roentgenologists whose training in gynecology is too often sketchy and who do not realize that surgery is the method of choice in many cases. Consequently the result of treatments of the entire group of fibroids throughout the country is by no means as good as it should be. Annually there are many unnecessary deaths because men who control their own cases and are attempting to develop themselves as surgeons see surgery as the one and only proper form of treatment. This group of men do not appear to realize that there is an inherent mortality attending surgery for fibroids, as much as 1½ to 2 per cent in any series of considerable size in the leading clinics of the world, and much greater in the hands of less experienced surgeons. On the other hand, there are many women whose condition has not been improved but who have been made miserable for life because of menopausal symptoms which have followed ill-chosen therapy with radium and the roentgen ray. Were the patients the only sufferers the case would be bad enough, but it is worse because a woman suffering from nervous reactions of the menopause does much to impair the efficiency of her husband, to break up the home, and to destroy the morale of her children. This shows, I believe, that the selection of proper treatment for fibroids, i. e., nothing, surgery, radium, and the roentgen ray is often a most important matter. Doctor Lindenberg, by the careful presentation in his paper, has done much to simplify this question. He limits the indication for roentgen ray in the paper under discussion to cases with hemorrhage. His work is well tabulated and shows well-chosen indications for treatment.

Our own experience agrees with Doctor Lindenberg's in nearly all points. He feels that roentgen ray should be considered for therapy in approximately 25 per cent of patients. Hemorrhage was a cardinal symptom in only 35 per cent of 700 fibroid cases of all ages in our series in San Francisco. If we would limit the treatment to women approximately of menopausal age, the percentage would be much smaller, possibly even less than the 25 per cent above stated. We agree with the statements: one, that the roentgen ray does not decrease the tumor by action upon the muscle cells but that it reduces the tumor only by killing the ovarian follicles; two, that the castration dose is the only logical method of roentgen-ray therapy; and, three, that it should not be used on young women, women who wish to bear children, or on women who are of a very nervous type.

His list of specified contraindications for roentgen ray treatment interests us extremely because we also are frequently mistaken in our diagnosis and confuse other conditions for fibroids. In many cases the error in the diagnosis is not extremely important. Yet one must realize that after the roentgen-ray treatment for fibroid the ovaries are killed and do not regenerate again.

We have not had as good results as has the essayist in the treatment of climacteric disturbances with ovarian and pituitary extracts. If we had such we would use roentgen-ray therapy more than we now do. I have given almost a barrel of pituitary and ovarian extract in routine treatment of castrated women, yet our good results are so few that I can almost call them to mind. Many of our patients still have marked vasomotor reactions after several years of treatment with glandular extracts, calcium injections and radiation over the pituitary glands. Nor have we found what type of woman responds to this type of therapy. Patients with high blood pressure do not show in our hands better results from the extract

* This case is dealt with in my article, "Coincidence of Fibroid Tumor and Exophthalmic Goiter with the Report of a Case Cured by X-ray Castration," American Journal of Obstetrics and Gynecology, Vol. xvi, No. 3, p. 425, September, 1928.

treatments than do those with low blood pressure, as was true in Polak's series. While we must admit that most of these women have unbalanced endocrine systems and might have had a stormy climacteric even if they had been left untreated, the sane physician will do as little as is possible to disturb a patient's normal reactions.

The paper should show clearly to all readers: first, that all fibroids do not demand treatment; secondly, that while good results may follow treatment either by surgery, radium, or the roentgen ray, that there are disagreeable sequelae which may attend any one of these types of treatment; and, thirdly, that the treatment of fibroid patients should lie in the hands of physicians who have had actual experience in all these methods of therapy because only such a person can wisely choose a proper treatment.

In conclusion, I wish to congratulate Doctor Lindenberg upon one of the best balanced papers on the roentgen-ray treatment of fibroids that I have recently had the pleasure of reading.

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WILLIAM H. SARGENT, M. D. (1624 Franklin Street, Oakland).—There is little to be added except possibly to reemphasize certain points.

It is my impression that radiation is a rather generally accepted method of treating uterine fibroids in a fair percentage of the cases. Its value has been proven to such an extent that it must receive some consideration in almost every case. It is a matter of determining whether it is indicated or not, if the best interests of the patient are to be served.

There are two groups of patients in which radium or the x-ray should receive first consideration. One are the typical cases that all are more or less familiar with, in which hemorrhage is the predominating symptom. The fibroids are small, not larger than a fair-sized orange, interstitial, the pelvis free of other pathology, and the patients well on toward the menopause. Even though good surgical risks, radiation should be the treatment of choice in such cases, since it offers them almost a 100 per cent chance of cure. Radium or the x-ray may be used. However, the former seems preferable.

The other group is made up of those patients in whom hemorrhage is also the predominating symptom but who are not good surgical risks for reasons of anemia or other pathology. Under these conditions radiation ceases to be a competitor of surgery and becomes an aid. It may change a very serious situation into a comparatively simple one in a most gratifying manner. Even though there may be pathology present which would ordinarily be considered unfavorable for radiation, it may be given with reasonable expectation that the hemorrhage will be stopped, or at least controlled, for a time sufficient to get the patient in a more favorable condition for operation.

Pelvic infection is a definite contraindication to the use of radium in this group, but when chronic it is not necessarily a contraindication to the use of the x-ray when it is cautiously used.

Occasionally, after radiation in those patients in whom we may expect a cure, menstruation does not stop completely, or it may stop for a varying length of time, and then recur. The question then arises as to whether surgery or further radiation should be resorted to.

If menstruation does not stop, and yet definite menopausal symptoms develop, surgery is advisable. If there are no menopausal symptoms, further radiation is permissible. Under these conditions a small dose of x-ray will usually suffice. It is not necessary to repeat radium. When a flow occurs after a period of time, and after a definite menopause has been established, it has the same significance as a "flow" after a natural menopause and requires the same consideration. When menstruation is being established the menopausal symptoms disappear or greatly decrease. When such occurs the patient may be kept under observation for a while. Menstruation may

again cease after a few periods without further treatment. If not, further radiation is permissible.

By observing the above, undue radiation of a case that should be operated upon may be avoided; or occasionally the patient may be spared an unnecessary operation.

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H. J. ULLMANN, M. D. (Cottage Hospital, Santa Barbara).—We should thank Doctor Lindenberg for his very careful review of the literature and summation of the indications for, and results of, radiation treatment of fibroids.

I cannot agree with Doctor Lindenberg, or the authors quoted, that the effect on fibroids is indirect and due to destructive action on the ovaries. It is true that where x-ray is used there must necessarily be severe injury to the ovaries, but this does not occur with intra-uterine radium applications, provided the dose is kept within reasonable limits. A good illustration of this is the difference in the effect of additional filtration if a moderate amount, such as .5 millimeter of silver is used. An almost immediate sensation of bleeding occurs, followed by rapid shrinking of the tumor, while if 1 millimeter of brass is added to the silver and the time of application increased, the effect on the fibroids themselves is distinctly reduced, while the effect on the ovaries is practically unchanged. If the dose with this filtration is not greater than 1200 milligram element hours there will usually be a return of menstruation within two or three years, provided that the woman is not already approaching her normal menopause. Cases have been reported where pregnancies have occurred some time after such a dose. Under these circumstances, no one, by the widest stretch of the imagination, could call such a dose a "castration dose." We have found very nervous women are frequently benefited by such a radium application, especially when near the menopause, and I have had several referred to me for such treatment by our neurologists, with very gratifying results. I quite agree that a mistake in diagnosis may be disastrous, and no radiologist is expected to treat a patient without having made every effort himself, by personal examination of the patient, to confirm the diagnosis. I believe that there is more danger in radiating a pyosalpinx than Doctor Lindenberg believes. I never radiate a patient with a history of pelvic infection if I can possibly escape doing so. I agree thoroughly with Doctor Lindenberg that a massive dose of x-ray should never be used in the treatment of fibroids. It is absolutely unnecessary, and I do not know that radiologists have ever considered treating fibroids as they would cancer. I was surprised to hear that a massive dose would render tissues more difficult for operative procedures. It is true that overdosage may in some localities, such as the thyroid, produce fibrosis, which increases the difficulty of operation, but I have repeatedly made inquiries of surgeons who had operated on a large number of patients who had received long and intense radiation over the pelvis, and in no case had they ever seen adhesions or abnormalities other than are often found under the same morbid conditions where radiation had never been used. I much prefer the use of radium to x-ray in fibroids for two reasons: first, because it is possible to make examination of the interior of the uterus to rule out carcinoma at the time the radium is applied, and, second, because ovarian function is conserved to a far greater degree than after x-ray.

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DOCTOR LINDENBERG (Closing).—The discussion shows clearly the diverse opinions of the radiologist and the gynecologist. For this reason I presented the gynecologist's attitude before the radiological section of our association.

Radium therapy was not within the scope of my discussion. When we consider the efficacy of radium in the treatment of fibroid tumors, we must remember that, in spite of its excellent results, such therapy carries with it a definite mortality. The introduction of

radium into the uterine cavity is, at best, a nonsurgical procedure, especially where its indication is most obvious, in submucous fibroids. The possibility of necrosis and sepsis is beyond the control of the attendant. The mortality in radiotherapy can mostly be attributed to the use of radium in this type of tumor. Since x-ray therapy is absolutely harmless we can understand why a number of gynecologic clinics have discontinued the use of radium in favor of roentgen rays in these benign tumors.

Radiology and surgery are not competitive measures, but supplant each other, depending upon definite indications. The ideal arrangement would require, therefore, that every gynecologist should be equipped to handle his own radiotherapy as he would the knife. Since such facilities are only occasionally at the disposal of the gynecologist his close cooperation with the radiologist will insure the choice of therapeutic procedure of greatest benefit to the patient.

THE CONTROL OF INTRACTABLE PAIN*

REPORT OF CASES

By E. B. TOWNE, M. D.
San Francisco

Discussion by Howard W. Fleming, M. D., San Francisco;
Charles D. Lockwood, M. D., Pasadena.

EVERY physician knows, too well, the patient who suffers from the pain of inoperable malignant disease. A cure is impossible, and therapeutic effort must be directed to alleviating the suffering of the remaining months of life. Increasing amounts of morphin give partial relief, but after a time a tolerance for the drug is established, and enormous doses are necessary. The final opium stage is most distressing to all concerned, and it should be avoided if possible. This paper deals with surgical procedures which will abolish or largely diminish the pain of malignant disease in certain portions of the body.

PAIN OF CANCER IN REGION OF TRIGEMINAL NERVE DISTRIBUTION

Cancers of the cheek, lip, anterior two-thirds of the tongue, floor of the mouth and accessory nasal sinuses are within the sensory distribution of the fifth nerve. In all cases which cannot be cured by complete excision, pain becomes, sooner or later, the dominant factor. Moreover, in certain cases which are cured and show no evidence of recurrence, there is distressing pain as a result of involvement of sensory fibres in the scar.

Treatment of these cases is based on the fact that if the involved area is rendered anesthetic, the pain must cease. The methods which are applicable to tic douloureux have proved successful here. Blocking of the superior maxillary or mandibular branches of the nerve with alcohol gives relief for many months, and the procedure may be repeated if necessary. If the nerves cannot be injected because of the location of the cancer, or if the pain is in the ophthalmic branch, permanent relief may be obtained by intracranial division of the sensory root of the fifth nerve. Grant¹ has published his results in thirty-five cases. Alcohol injections were done in twenty-four, with complete relief in seventeen, partial relief in four, and no result in three. In ten cases he could not reach the nerve. In five of these, and

in five others where injection was not attempted, the sensory root was divided with these results: complete relief in six, partial relief in one, no relief in one, one death from septic meningitis and one operative death.

The following case reports illustrate favorable results from these two methods of treatment:

CASE 1.—M. L., a man aged 53, was seen in November, 1925. He had an inoperable carcinoma of the anterior third of the left side of the tongue which involved the floor of the mouth. He complained of constant pain, day and night. The pain was not present with the onset, fourteen months previously, but had started after radium therapy, five months before entry. The mandibular branch of the trigeminus was injected with alcohol at the foramen ovale. Relief was immediate, and when he was last seen, seven months later, anesthesia was still present and he was free from pain. He was very thin and cachectic, and it is probable that he died shortly after that time.

CASE 2.—O. E. O., a man aged 59, was seen in June, 1927. A radical removal of a carcinoma of the left maxillary antrum, including its anterior, superior and medial walls, and most of the malar bone, had been done in November, 1926. Pain had not been an important factor before operation, but afterward it became constant though not very severe. He did not resume his occupation after operation. For three months he had taken morphin in increasing doses, with little relief. The pain was in the ophthalmic and superior maxillary branches. The left eye was blind as the result of glaucoma. The sensory root of the fifth nerve was divided, and the left eye was removed. He was entirely relieved of pain. Five weeks after operation he returned to his work as superintendent of construction. In October, 1927, he had gained forty-three pounds and was working regularly. He said that he had never felt better. There was no evidence of recurrence of the tumor.

PAIN OF CANCER IN REGION OF GLOSSOPHARYNGEAL NERVE DISTRIBUTION

Malignant tumors of the posterior third of the tongue, the tonsils and faucial pillars, the pharynx and the nasopharynx are in the domain of the glossopharyngeal nerve. Dandy² has twice divided this nerve in the posterior fossa for neuralgia, with immediate relief. There was complete anesthesia in the distribution of the nerve. He remarks on the applicability of the procedure to inoperable carcinomas of the tonsil and nasopharynx. I have not yet had occasion to do this, nor is a case recorded.

PAIN IN LEGS AND BODY UP TO NIPPLE LINE

The more important causes of the pain which may be relieved by the operation to be described are: injuries and primary or secondary tumors of the spine, inoperable malignant tumors of the pelvis and lower extremities, and tabes dorsalis. In many cases these pains are extremely severe, and little affected by opiates. Division of posterior nerve roots proved to be unsatisfactory. In 1905, Spiller demonstrated that sensations of pain and temperature are conveyed in the anterolateral columns of the spinal cord. The first division of the anterolateral tract was done on one of Spiller's patients in 1911. In 1920, Frazier³ brought the procedure to general attention by publishing a report of six cases, with complete relief in five and partial relief in one. Since then, many more have been recorded and the operation is now a standardized one which gives

* Read before the General Surgery Section, California Medical Association, at its Fifty-Seventh Annual Session, April 30-May 3, 1928.

almost uniformly good results. There is loss of pain and temperature sensation on the opposite side of the body up to a level about three segments below the segment incised. Motion, reflexes, and all other forms of sensation are unimpaired. The patient is not troubled by loss of pain and temperature sensation because tactile, joint and position sensations are normal. Peet's⁴ results in nineteen cases were: complete relief of original pain in sixteen; partial relief in two, and complete but apparently temporary relief in one. The primary conditions in his series were: carcinoma of the uterus or cervix, nine; carcinoma of the breast, two; sarcoma of the leg, two; carcinoma of the prostate, one; carcinoma of the lung, one; retroperitoneal malignancy, one; pain in the legs associated with spasmodic contractions, one; pain in the legs of unknown origin, one, and traumatic sciatic neuralgia, one.

CASE 3.—M. C. R., a woman aged 49, was seen in February, 1926. She had an inoperable carcinoma of the uterus with pelvic metastases. For five months she had suffered from increasingly severe pain in the lumbar region and down both legs. Very large doses of morphin gave only partial relief. Under nitrous oxide and local anesthesia, a laminectomy was done on the second, third and fourth dorsal vertebrae, and both anterolateral columns were divided to a depth of 3 mm. There was complete loss of pain and temperature sensation up to and including ninth dorsal segment on both sides. Motion, reflexes, and all other forms of sensation were unimpaired. Opiates were discontinued after two weeks. The patient was entirely free from pain until her death in April, 1927, fourteen months after operation.

CASE 4.—M. A., a man aged 27, was seen in August, 1926. Gastric crises of tabes began early in 1924 and the attacks were increasingly prolonged and severe. Thorough antiluetic treatment had given no result. In May, 1926, the fifth to twelfth intercostal nerves on the left side had been divided, without result. Two to three grains of morphin were used each day. A bilateral chordotomy was done on the fifth dorsal segment of the cord in October, 1926, resulting in loss of pain and temperature sensation up to and including the seventh dorsal field on both sides. It was necessary to catheterize the patient for two weeks. Morphin was discontinued after four weeks. The epigastric pain and vomiting did not recur while he was under observation, and his weight increased twenty-eight pounds. In January, 1927, three months after operation, the patient was deported to Mexico and it has been impossible to get any further information.

Comment.—Case 3 is a typical example of a condition which is practically always relieved by the operation of chordotomy. In such cases the pain must be conveyed up the anterolateral columns, and division of the columns should abolish it. There is a difference of opinion as to how the pains of tabes are transmitted to the brain, and here the operation of chordotomy is not on a sound basis. However, Leighton has reported complete relief in two cases, and partial in one; therefore, the attempt seemed justified in Case 4. It is regrettable that the final result will not be known, but the patient was well satisfied with the three months period of freedom from pain.

SUMMARY

Intractable pain, usually due to inoperable cancer, which condemns the patient to an opium existence, may be relieved by certain surgical

procedures when located in some portions of the body. When the lesion is within the distribution of the trigeminal nerve, the involved branch should be injected with alcohol, or the sensory root should be divided. Cases illustrating good results from these two methods are reported in this paper. When the lesion is within the distribution of the glossopharyngeal nerve, the pain should be relieved by division of the nerve in the posterior fossa. This operation has been used only for glossopharyngeal neuralgia, but the resulting anesthetics indicate that it is applicable to the pain of malignant disease. Finally, pain below the nipple line may be abolished by division of the anterolateral columns of the spinal cord. This operation makes the transmission of sensations of pain and temperature impossible. It is applicable to a large variety of cases, of which the most important are injuries of the spine, inoperable primary or metastatic tumors of the spine, and inoperable tumors of the pelvis and lower extremities. A favorable result in one such case is reported here, and also an apparently good result in a case of gastric crises, in which the anatomical basis for the operation is questionable.

350 Post Street.

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DISCUSSION

HOWARD W. FLEMING, M.D. (384 Post Street, San Francisco).—Doctor Towne's paper on intractable pain emphasizes a most important subject. All too frequently physicians lose interest after the diagnosis of an incurable malady is made. The plight of such patients is most discouraging and distressing. The feeling of utter futility often makes us neglectful. Morphin is the usual course of treatment, and is far from satisfactory.

Doctor Towne's paper enumerates several surgical measures that have proven worth while in affording relief of pain. Any patient whose expectancy of life is three months or longer deserves the relief of pain which such palliative operation can give. My experience with these operations described by Doctor Towne leads me to indorse heartily all he has said about this important subject.

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CHARLES D. LOCKWOOD, M.D. (65 North Madison Avenue, Pasadena).—Surgeons too often lose interest in their patients when they find postoperatively that they have failed to relieve the trouble for which they have operated or find that their patient is suffering from an incurable disease. Doctor Towne's paper should stimulate us all to undertake further measures of relief for the sole purpose of rendering life more tolerable even for a short time to those suffering from intolerable pain.

My own experience in this field has been limited to pain in the distribution of the trigeminal nerve, the result of malignant tumor of the brain and due to trifacial neuralgia. Here deep injections of alcohol will give relief for many months and section of the sensory root of the fifth nerve will give permanent relief. I have also been able to relieve pain in the sciatic nerve, associated with carcinoma of the pros-

tate, by alcohol injections into the sensory root of the sacral plexus.

I would not hesitate to expose the spinal cord and do a chordotomy, as suggested by Spiller, Leighton and others.

BRAIN TUMOR*

ITS PRESENTING SYMPTOMS

By CYRIL B. COURVILLE, M. D.
Loma Linda

DISCUSSION by Carl W. Rand, M. D., Los Angeles; E. B. Towne, M. D., San Francisco.

CONTRARY to the general opinion, brain tumors are common lesions. This fact alone is enough to stimulate our interest in them. It has been shown that in the larger general hospitals that from 0.2 to 0.8 of one per cent of the cases coming to necropsy have tumors of the brain. Dowman¹ taking the most conservative figures, estimates that of the 115,000,000 inhabitants of the United States, 230,000 will be victims of this lesion. If this number be divided by fifty, which is the average age of the generation, there will be 4600 cases each year. This is indeed an impressive figure when we compare it with even some of the more common lesions with which we come into contact in daily practice.

PESSIMISTIC VIEWPOINT CONCERNING BRAIN TUMORS

One disconcerting factor has been the lack of more definite conceptions regarding the pathologic nature as well as the clinical manifestations of the lesion. In a general way, tumors of the brain have been regarded as inoperable lesions having an uninterrupted downward course leading to a fatal ending. Recent researches by Bailey and Cushing² indicate that many of the gliomas are slow growing and consequently are amenable to surgical attack. Tumors having their origin from the bony vault and the meninges offer even a better prognosis. In view of this we must alter many of our older opinions and recognize that, with the exception of metastatic growths, many intracranial tumors are essentially benign lesions and that early removal will result in a cure of the patient.

Another influence, acting unconsciously perhaps, which has prevented the discovery of these cases, is the idea held by many that most of these patients are victims of attempted surgery and would live longer without it. If this be the case the accurate detection and localization of the lesion is of no practical value. Surgery has in times past been attended with a high mortality, not necessarily because the tumor is impossible of removal, but rather due to the patient's weakened condition and the size of the lesion at a late stage of the disease when treatment has been instituted as a last resort. It is not unreasonable to believe that, just as has been the case with abdominal surgery, the present generation will see a progressive decrease in the mortality of operations on the brain. Technical difficulties in cranial procedures will always make the surgical risk greater than

that associated with the simpler operations of the abdomen.

DIAGNOSIS

The diagnosis of brain tumor is usually possible and in many cases not difficult. This, however, does not correspond with the general experience in the past. As Cushing³ has said, "A tabulation of the various diagnoses made in the early stages of a series of brain tumor cases would make a professionally disconcerting record." The essential reason why this state of affairs has existed is that the physician has failed to include a new growth involving the intracranial space in the list of possibilities when a given symptom has brought the patient to his office. A careful study of the presenting symptoms of these cases should, in most instances, make one suspicious of intracranial pathology. A neurological examination with the aid of the roentgen ray, especially after air has been injected into the ventricles, usually makes possible a positive diagnosis of the presence and location of the tumor.⁴

THE PRESENTING SYMPTOMS OF BRAIN TUMOR

If, then, brain tumors are common, sometimes curable, and usually discernible, is it not advisable to look well into their presenting symptomatology? Let us review the complaints which frequently bring these patients to the physician, not attempting to discuss the more technical aspects which are of interest only to the neurologist.

PRESSURE SYMPTOMS

Headache.—This notoriously protean symptom is one of the most common manifestations of brain tumor. Its association with manifold simple conditions tends to disarm the observer and to lead him to attribute its presence to an apparent condition in the upper respiratory passages, the eyes, or other and more distant troubles. For this reason the nature of its etiology is not suspected until an advanced stage of the disease in many instances.

The headaches of brain tumor cases are variable. They may be but slight until late in the disease, or may be of great intensity almost from the onset. They are often described as bursting in character, the patient feeling as though the head were going to split. An agonizing headache which tends to recur day after day should arouse the suspicions of the attending physicians that its cause is organic.

If it is worse in the morning, or upon change of position, and if accompanied at the height of the attack by vomiting, it is not infrequently due to an intracranial new growth. The location of the headaches is not always characteristic and often is misleading. It is probably due to a stretching of the dura incident to local or general increase in pressure.⁵ It is commonly fronto-occipital due to the focusing of converging lines of pressure in these regions.⁶ It may be referred likewise to the opposite side of the head and is due to a transmission of the pressure.

Vomiting.—Projectile vomiting, usually described as a feature in the intracranial pressure syndrome, is absent in perhaps two-thirds of

*From the Neurological Service, Loma Linda Sanitarium and Hospital.

⁶Read before the San Bernardino County Medical Society on May 8, 1928.

the cases. It is most frequent in tumors situated in the posterior fossa and occurs usually at the height of the accompanying headache. It may be associated with a definite sensation of nausea, but usually has no relation to food intake. It is perhaps of more consequence to emphasize the fact that vomiting associated with tumor symptoms is not necessarily projectile. A patient was brought to this institution about a year ago with vomiting as the presenting symptom. Food poisoning was suspected by the attendant physician. The patient died a few days after admission and necropsy revealed multiple melanotic tumors of the brain. Recurrent vomiting associated with headache, having no relation to meals or unaccompanied by abdominal distress, should indicate an investigation of the central nervous system. Many children having cerebellar tumors are carried along with the diagnosis of recurrent vomiting, pyloric stenosis, or intestinal disturbance of other types, and not a few have had negative abdominal explorations.⁷

Vertigo.—Dizziness is a fairly common and yet poorly understood symptom. Its causes, like that of headache, are manifold. The dizziness of intracranial tumor is not characteristic, except in its tendency to be persistent and progressive. It may be characterized by the definite sense of rotation of surrounding objects, as found frequently with posterior fossa tumors, or by irregular and indefinite sensations of unsteadiness on the feet. In the latter instance it is frequently due to choked labyrinth, which corresponds to a choked disk.⁸ Persistent dizziness, especially in young adults, in the absence of definite middle ear disease demands careful investigation, for it is suggestive of pathology within the cranial cavity.

MENTAL SYMPTOMS

The occurrence of mental aberrations as symptoms of brain tumors is well known. The fact that many mental cases have brain tumors, however, is not so well understood. It has been estimated by Blackburn⁹ that about 2 per cent of all cases of insane patients that come to autopsy have tumors of the brain. Mental symptoms are not indicative of frontal lobe lesions necessarily, but may accompany tumors in adjacent areas, involving the higher psychical centers secondarily, or as a part of the symptom complex of massive gliomas undergoing degeneration, probably a toxic psychosis. Severe headaches themselves often result in a slowing of the mental processes and minor character changes.

Delusions and hallucinations play an important rôle in the mental changes in frontal lobe tumors, although they may occur as isolated symptoms of disturbances of other lobes. Auditory hallucinations usually considered as evidence of a definite psychosis have been shown to be a symptom of temporal lobe tumors, when unaccompanied by mental changes. Cases which present mental phenomena with other symptoms suggestive of an increase of intracranial pressure as headache or vomiting, should be investigated for an organic brain disorder. If a routine neurological examination could be done in all these cases, especially a study of the eyegrounds, without doubt many

cases of brain tumor would be isolated from the ever growing list of the insane.

OPTIC SYMPTOMS

A large percentage of cases of intracranial tumors at some time in the course of their illness have had glasses fitted in an attempt to relieve the visual disturbances present. It is not at all strange then that the oculist should be the first to see many of these cases and, if doing scientific work, can direct many of them to proper individuals for help. Failing vision, double vision, or visual hallucinations are often early symptoms.¹⁰ They are extremely suggestive in the young. Every individual with visual disturbances should be examined by one trained in this branch of medicine, and the investigation should include visual acuity, perimetry, and a study of the fundi with the ophthalmoscope. Tumors of the pituitary region, whether the adenoma of the adult, or the craniopharyngeal pouch cyst of the child, frequently show early failure of vision with optic atrophy, often with characteristic changes in the perimetric fields. These changes may vary from a segmental or a quadrantal defect to a complete bitemporal hemianopsia. Tumors of the temporal and occipital lobes if within the hemisphere are prone to compress or destroy the optic path resulting in homonymous hemianopsia. Visual hallucinations of form have been shown to be an accompaniment of temporal or frontal lobe tumors, in the latter instance it being a part of a psychosis.¹¹ Hallucinations of light, such as flashes, streaks, and zigzag effects, are often observed by patients having lesions of the occipital lobes.

AUDITORY SYMPTOMS

Symptoms indicating disturbance of hearing are so frequent and accompanying such a large variety of lesions that it is not at all strange that their association with brain tumors is often not considered. Even as a tumor symptom the manifestations are so protean as to be confusing. Tinnitus, in the form of a buzzing, ringing, or roaring in the ears, impairment or loss of hearing, or auditory hallucinations may be present. None of these can be considered as diagnostic of tumors of the auditory pathway *per se*, and therefore must be considered in the light of other findings in the case. Such phenomena may be evidence of pressure involving the end organ, irritation or compression of the acoustic nerve, or interference of the central pathways or of the cerebral cortex. Auditory hallucinations unaccompanied by evidence of a psychosis are very suggestive of temporal lobe involvement.¹² The subjective syndrome of tinnitus, progressive deafness in one ear, vertigo, numbness of the homolateral side of the face, with headache and vomiting, is pathognomonic of a cerebellopontine angle tumor.¹³ Bilateral deafness due to a cortical lesion is extremely rare, although such a case has been recently reported.¹⁴ It occurs more frequently with tumors involving the corpora quadrigemina.

MOTOR SYMPTOMS

Motor phenomena associated with tumors encroaching upon the intracranial space may be irritative or compressive. The irritative symptoms

are manifested commonly as convulsions of a general or local (Jacksonian) nature. It has been estimated that approximately a third of these cases have seizures in some form during their course.¹⁵ Many had been diagnosed as idiopathic or essential epilepsy and were so treated for years. Later other symptoms and signs were added which suggested the organic basis of their etiology. This fact is not without significance. Are we justified in the face of such evidence to pronounce all cases presenting generalized convulsions as being epileptic without a careful study? It is true that they may present no neurological signs at the time of examination, but the patient should be encouraged to return to the physician at periodic intervals for observation, or whenever the case presents a new or altered phenomenon. This program would without doubt be a valuable factor in the earlier diagnosis in cases of brain tumor.

Jacksonian convulsions, with their definiteness as to manifestation and their value as a localizing element, are relatively frequent. We cannot assert that every case presenting this type of motor disturbance has a brain tumor, for to do so would fail to recognize many other types of focal pathology. If convulsions of a single extremity should occur a complete examination will usually reveal other signs to establish a pathologic diagnosis. With a reasonable suspicion, ventricular puncture with injection of air may help confirm or rule out the presence of a new growth.

Motor disturbances in the nature of hemiparesis or a complete hemiplegia may be present. In the first instance, motor weakness usually indicated a compression of the motor area by a neighborhood lesion. Meningiomas (dural endothelioma) arising from the falx cerebri compressing the upper motor area, are usually accompanied by a weakness in the lower extremity of the opposite side. This one sign, together with an increase in the vascularity of the cranial vault as shown by the roentgenogram will strengthen the diagnosis of a meningioma in this location.¹⁶ Complete paralysis of one extremity of the upper motor neuron type, especially with a slow onset, should be regarded as suspicious of a tumor in the motor area. Without doubt many cases of hemiplegia are due to tumors which have been attributed to a cerebral hemorrhage. In a necropsy some months ago we found a metastatic tumor in the left cerebral hemisphere of an aged male patient whose condition had previously been diagnosed as a cerebral hemorrhage. A primary (entirely unsuspected) growth was found in the lung. It is never safe to presuppose the etiology of abnormalities of motor function of central origin. A careful review of the history is helpful as it usually suggests the etiology. A neurological examination will usually indicate the presence or absence of an expansive intracranial lesion.

SENSORY SYMPTOMS

While not marked and characteristic as in lesions of the spinal cord, subjective sensory phenomena may be an integral part of the brain tumor syndrome, especially if the growth is located

in or adjacent to the sensory pathway. Paresthesia and anesthesia associated with motor phenomena in a single member or in one side of the body are suggestive, although one must be careful to rule out the dissociation of sensation as found in hysteria. Usually a careful objective study will make the nature of the condition clear. Jacksonian seizures are often preceded by sensory auras in the form of numbness, formications, flashes of hot or cold, or shooting or aching pains. Lesions in the sensory cortex may give rise to "sensory fits" independent of any motor disturbances. Thalamic lesions, associated with deep-seated aching pains, are often the result of cerebral hemorrhage although they may occur with tumors. Astereognosis, indicative of parietal lobe pathology, is often manifested first by failure of the patient to recognize coins in his pocket with one hand. Loss of deep sensibility is usually described as "losing" the arm or leg in space so that the patient is at a loss to know of its position. Perhaps in no other series of symptoms is it so important to analyze the history and characteristics so carefully as in this, and to verify impressions gained by painstaking and repeated examinations.

SUMMARY AND CONCLUSIONS

Common complaints may be and frequently are presenting symptoms of brain tumor. These lesions are far more common than usually supposed, and they demand that the family physician be on the alert so as not to overlook them. Every suspicious symptom should be carefully investigated and a neurologic study made in those cases in which intracranial pathology is suspected. The outlook for brain surgery today is the same as that of abdominal surgery a few decades ago. Its success depends upon an early diagnosis and properly applied surgical methods. Its future depends upon both the surgeon and the family physician, for it is to the latter that the patient first comes for help. A correct suspicion properly followed out surgically will at least relieve the distressing headache, save the eyesight, and in many cases prolong the patient's life in relative comfort.

Loma Linda.

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DISCUSSION

CARL W. RAND, M. D. (1023 Pacific Mutual Building, Los Angeles).—It is opportune that Doctor Courville has emphasized the relative frequency of brain tumors at this time. There is little doubt that these lesions are more common than has been generally supposed. Indeed there is no reason why the brain should not be the seat of tumors as frequently as any other organ. This is probably the case. The principal reason why these lesions have been considered rare is because many existing cases have not been recognized.

Perhaps our experience in the neurosurgical service at the Los Angeles General Hospital will bear this out. The service was established approximately eight years ago. At that time it was seldom that we saw a brain tumor, possibly a half-dozen examples coming to our attention during the first year. The number of cases has gradually increased. Two years ago a resident was provided for the service. He had free access to the medical and surgical cases in the house, as well as the opportunity of visiting the outpatient clinic for the purpose of picking out any possible cases of brain tumor. The results were gratifying. Last year approximately thirty-five brain tumor cases were treated on the neurosurgical service.

Our experience at the General Hospital should serve as a fair index of what may be expected in the practice of medicine taken in its larger sense, if physicians would be more on the outlook for cases of brain tumor. Persistent headache, focal convulsions or those appearing late in life, visual disturbances such as double vision or contraction of the fields, gradual failure of vision, ringing in one ear followed by approaching deafness, instability in walking, dizziness, gradually increasing weakness of one or more extremities, sensory disturbances, or some other sign may act as the presenting symptom in a case of brain tumor. Methods of investigation have improved to such an extent that in a majority of cases the presence of a brain tumor should be diagnosed even if its position is not exactly known. Moreover, its localization and character should be determined in an increasing number of cases and a fair estimate should be given in advance as to how much can be done surgically in each particular case.

Newer methods of attack have increased the number of tumors which can be entirely or partially removed, and consequently the period of life in patients suffering from these lesions has been gradually increased. It is the purpose of Doctor Courville's paper, I take it, to present briefly the cardinal symptoms of brain

tumor so that we may be more on the alert for these not infrequent lesions.

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E. B. TOWNE, M. D., (350 Post Street, San Francisco).—Doctor Courville's paper gives an excellent summary of the leading symptoms of tumor of the brain. It is obviously impossible, when dealing with such a complex organ, to include all the possible early manifestations. The diagnosis of tumor of the brain is frequently easy, but this is usually in advanced cases. However, a great deal depends on the location of the tumor. One that gives Jacksonian epilepsy and hemiparesis, for instance, can hardly be mistaken, but many frontal lobe tumors grow to large size before the true situation is suspected. The most important thing is for the physician always to have in mind the possibility of tumor of the brain when dealing with any obscure condition pointing to the intracranial cavity. It is now possible to make the diagnosis and the localization in nearly every case. Visualization of the ventricular system by the method introduced by Dandy in 1918 has been largely responsible for this marked improvement in the situation. It must not be forgotten that the earlier the diagnosis can be made the better the patient's chances are if the tumor is of a character which permits removal.

THE SELECTION OF DIURETICS*

By LEONARD G. ROWNTREE, M. D.

Rochester, Minnesota

THE use of diuretics dates back to antiquity, for dropsy has been known since before the dawn of medical history. One Babylonian tablet earlier than 6000 B. C. records a case of dropsy for the "instruction of sufferers." Cases were recorded by the Father of Medicine in the Golden Age of Pericles, and Galen in Rome's imperial day disputed with Asclepiades concerning the mechanism of the origin of ascites. Sydenham, the father of modern clinical medicine, wrote a treatise on dropsy in Pepys' day, that for medical wisdom will serve as a model for all time. Innumerable workers have since written on the subject, but I feel that I can do no better in approaching it than to quote some of the statements of this wisest and greatest of English clinicians. He discussed the indications in dropsy for purgatives, emetics and diuretics. After describing his success in the treatment of his first and most marked case of dropsy, he proceeded as follows:

"In the confidence of youth and inexperience I fancied that I had now a sovereign remedy for dropsies; one that would subdue all alike. A few weeks undeceived me. I was then called in to a female patient who labored under a dropsy that had supervened on a quartan ague. I prescribed the syrup; repeated it; exasperated the disease. After a time, as the water remained the same, the purging continued, and the tumor increased, the lady changed my services for those of another physician, who, after my dismissal, gave her more appropriate remedies and cured her accordingly."

In discussing the subject of diuretics it is necessary to take into consideration (1) the function of the kidney, (2) the mechanism of the

* From the Division of Medicine, The Mayo Clinic, and The Mayo Foundation, Rochester, Minn.

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secretion of urine, (3) the nature of the action of diuretics, and (4) the nature of the disease and of the accompanying injury to the kidney.

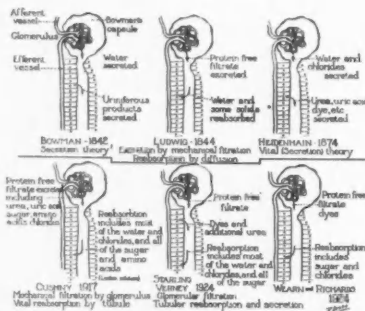


Fig. 1.—Schematic presentation of various theories of urinary secretion (Hench).

These matters are essential for the best selection of a diuretic for the individual case.

THE FUNCTION OF THE KIDNEY

The function of the kidney is to separate from the blood substances carried to it for excretion and to pass these substances out of the body as urine. The purpose behind urinary secretion is the important consideration; that is, to keep constant the volume and composition of the blood

TABLE 1.—Volume and Composition of Blood and Urine

	Blood plasma	Urine	
	Volume, cc. for each kilogram of body weight (approximately)	Volume, c.c. in 24 hours	Ratio of concentration in blood and urine
Average	50	1400	
Maximum	60	2400	
Minimum	40	800	
Composition			
Water	90 to 93	95	
Proteins, fats	7 to 9		
Glucose	0.1		
Sodium	0.3	0.35	1
Chlorid	0.37	0.6	2
Urea	0.03	2.0	60
Uric acid	0.004	0.05	12
Potassium	0.020	0.15	7
Ammonium	0.001 (?)	0.04	40
Calcium	0.008	0.015	2
Magnesium	0.0025	0.006	2
Phosphate	0.009	0.15	16
Sulphate	0.002	0.18	90
Creatinin	0.001 (?)	0.075	75

TABLE 2.—Water Balance (DuBois)

Water intake (daily):	Gm.
Drinking water.....	300
In coffee, milk and soup.....	580
In solid foods.....	720
From oxidation of 100 gm. of protein.....	41
From oxidation of 100 gm. of fat.....	118
From oxidation of 244 gm. of carbohydrate.....	135
Total	1894
Water output (daily):	
In urine.....	750
In feces.....	300
Vaporized through skin and respiratory tract.....	700
Total	1750
Plus balance to body.....	144
Gain in body weight.....	100

and to purge the body of waste, superfluous, noxious and foreign substances. This involves: (1) excretion of water, in excess of bodily needs and in volume sufficient to keep the solids of the urine in solution; (2) excretion of salts, the cations and anions both being important; (3) excretion of certain end products of metabolism such as urea and creatinin; (4) excretion of certain foreign material such as drugs and dyes, and (5) synthesis, as exemplified in hippuric acid.

THE MECHANISM OF URINARY SECRETION

The three principal theories of urinary secretion are those of Ludwig, of Bowman and Heidenhain, and of Cushman. Hench has shown these schematically in a very ingenious manner (Fig. 1). Although these ideas are merely theoretic, Cushman himself stated that most of the work of recent years strongly supports his theory. The illuminating experiments of Richards and Wearne prove by chemical analysis the presence of sugar and salt in the urine, as it is found in Bowman's capsule. Reabsorption, at least of glucose, therefore, must occur normally.

Cushman also has introduced into the physiology of urinary secretion the conception of threshold and nonthreshold bodies. This is a consideration of real significance. Those with a high threshold, glucose, sodium, chlorids, bicarbonates and amino acids, are excreted only when present in the plasma in concentrations in excess of the normal level. Phosphates, sulphates, creatinin, and certain drugs such as iodids are always excreted in the urine irrespective of the level in the plasma. For certain other products, such as urea, urates and potassium, the evidence is not entirely clear.

The main constituents of the urine, a comparison of their concentration in the blood and urine and the concentrating capacity of the kidney are shown in Table 1, taken from Cushman. To this I have added figures showing normal fluctuations in the volume of the plasma and of the urine. The composition of the plasma is maintained within narrow limits whereas the volume and composition of the urine is variable, fluctuating to balance the intake of water and food.

The balance of the daily output to the daily intake is effected for many substances. The water

TABLE 3.—*Approximate Daily Output of the Kidney*

Water, c.c.	Solids, output		Acid		Base	
	Organic	Inorganic	c.c. 1/10 N		c.c. 1/10 N	
1200 to 1500	38.2 gm.	22.7 gm.	2548		2368	
	Urea 32.0	Sodium chlorid 14.0	Phosphorus 925		Calcium 365	
	Creatinin 1.8	Phosphoric acid 2.0	Chlorin 810		Magnesium 283	
	Uric acid 0.7	Sulphuric acid 2.6	Sulphur 813		Potassium 870	
	Ammonia 0.7	Potassium oxid 3.0			Sodium 850	
	Hippuric acid 0.8	Magnesium and calcium oxid 0.9				
	Residual organic 2.2	Residual inorganic 0.2				

balance is fairly well understood and is illustrated in Table 2, from DuBois. In clinical practice the water intake usually is measured or calculated as represented in water and beverages and the output as represented in urine and feces, leaving out of consideration the water taken in solid foods, the water of oxidation, and the water lost through the skin and respiratory system. Fortunately, these elements which usually are left out of consideration practically offset each other; therefore the results of the rough measurements are approximately correct, and are of considerable clinical value.

The work accomplished by the kidney can be better appreciated if visualized in terms of daily average (Table 3).

There are certain significant considerations in urinary secretion which can be suggested in three short paragraphs.

The function of the glomeruli is to filter deproteinized plasma. This can be expressed by the formula $F=P-p$, in which F =filtration, P =blood pressure in glomeruli and p =pressure

of urine in tubule. The osmotic pressure of proteins in the blood is 25 to 39 mm. of mercury. Below this pressure no urine is secreted. Blood pressure is an important consideration, since pressure factors influence filtration.

The function of the tubules is seen in the reabsorption of Locke's solution. The tubules are said to excrete urates in birds with ligated ureters. They are said to excrete certain dyes (Marshall's evidence in *Lophius piscatorius*). They also are said to excrete salts foreign to the organism, such as iodids. The Nussbaum experiment indicates active secretion on the part of the tubules. Phenolsulphonephthalein seems to be concentrated in tubules but secretion may take place in them.

General considerations that must be kept in mind are as follows: Diuretics may bring additional glomeruli into action; blood flow through the kidneys is excessive in diuresis (Krogh), four to nineteen times its share by weight; there is a local vasomotor mechanism controlling blood supply and secretion of urine; stimulation of the

TABLE 4.—*Various Types of Diuretics*

Diuretic	How and by whom introduced	Mechanism of diuresis	Indication	Comment
Water	Common experience	Unknown; probably increased water in the blood	Oliguria in absence of edema	Many theories; increase in output only with excessive intake
Hypertonic sodium chlorid	Common experience	Reduced protein content and increased water content	Anhydremic states; toxemia	Cations and anions both important: potassium, calcium, ammonium, nitrate, chlorate, acetate
Sugar	Said to be result of milk and grape cures	Tissue dehydration	Acute toxemia	Used mostly in oliguria
Urea	Friedrich, 1892	Osmotic effects	Edema in absence of uremia	Good effects
Digitalis	Empirically; Withering	Improvement in circulation	Cardiac dropsy	May be helpful in renal forms of edema, especially in the aged
Caffein and ephyllin	From beverages; Von Schroeder	Improvement in circulation. Stimulation of cells of renal tubules	Cardiac and other forms of edema	Many derivatives
Calcium chlorid	Schultz; Blum	Formation of acid	All forms of edema	Too great gastro-intestinal irritation
Ammonium chlorid and ammonium nitrate	Experimentation Haldane Gamble Keith	Formation of acid and of urea. Effect on tissues	All forms of edema in absence of uremia	Generally useful; urea and carbon dioxid combining capacity
Merbaphen	Diuretic effect long recognized Wagner and Saxl and Hellig	Effect on tissues. Formation of acid. Renal irritant	All forms of edema except acute nephritis	Excellent diuretics; used at intervals only

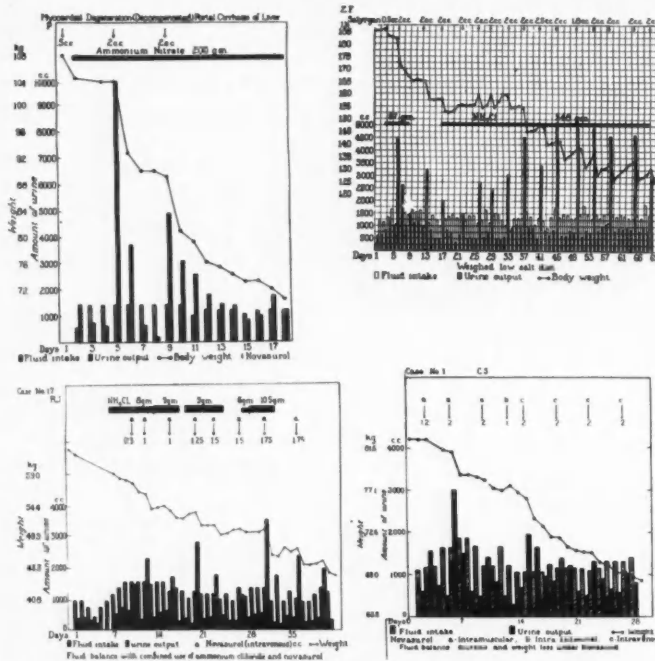


Fig. 2.—Diuretic effect of merbaphen in nephrosis, myocardial insufficiency, cirrhosis of the liver and polyserositis.

splanchnic nerves causes cessation of glomerular flow (Bieter).

THE USE OF DIURETICS

A list of the various diuretics, together with their actions and indications for use, is given in Table 4. A discussion of diuretics leads naturally to a consideration of edema and uremia.

Certain diuretics are of great value in certain forms of edema and not of much value in other types. For instance, digitalis is of great value in the dropsy of cardiac origin and has a relatively slight effect in ascites of cirrhosis of the liver or nephrosis. On the other hand, merbaphen is of great value in many types of edema. Figure 2 shows that it is equally effective in nephrosis, myocardial insufficiency, cirrhosis of the liver and polyserositis. It cannot be used safely, however, in acute nephritis and acute infections of the

kidney. The ammonium salts likewise can be administered in many forms of edema. Their use may be questioned in the presence of uremia or in the presence of an increase of urea in the blood. Ammonium chlorid occasionally induces acidosis and ammonium nitrate occasionally induces cyanosis due to methemoglobinemia. In my experience these never have proved of serious consequence. Merbaphen occasionally induces diarrhea which is sometimes hemorrhagic in character and which may precipitate hematuria in the presence of acute pathologic processes. Occasionally also purpura may develop following its use. I have not noted, however, any serious injury from the use of merbaphen.

Calcium chlorid is of value but is used infrequently now because of its irritant action on the gastro-intestinal tract and the fact that the same results can be obtained with ammonium salts with less irritation. The striking effect on the urinary output and on the body weight is shown in column 4 in Figure 3. This did not come, however, until after paracentesis.

In combining edema of all types, a salt-free diet is often a most important consideration. Table 5 shows that it is possible to construct diets that are adequate from a calorie point of view but extremely low in the content of sodium and of chlorin.

NATURE OF THE DISEASE AND OF THE INJURY TO THE KIDNEY

In considering various diuretics, the various types of diseases for which these drugs are used must be taken into account. The diseases may

TABLE 5.—Salt-Free Diets Used in Nephritis and Nephrosis with Edema

Diet Number	Composition, gm.						
	Carbo-hydrate	Protein	Fat	Calcium	Water	Sodium	Chlorid
1	190	40	65	1500	1300	1.15	1.60
2	150	40	80	1500	800	0.50	0.70
3	235	50	145	2500	900	0.77	0.88
4	300	60	120	2500	930	0.70	0.90
5	350	70	85	2500	850	0.68	0.85
6	345	80	90	2500	950	0.67	0.75
7	320	90	95	2500	860	0.65	0.78
8	275	100	110	2500	920	0.75	0.80

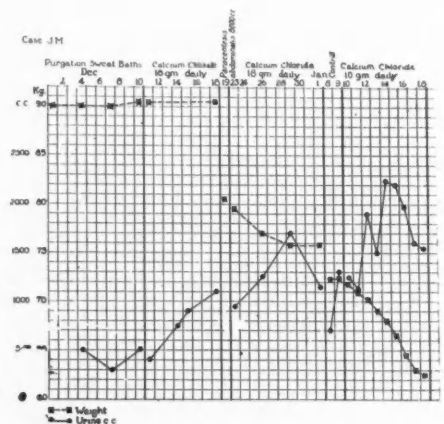


Fig. 3.—Effect of calcium chlorid on the urinary output and body weight in a case of nephritis.

TABLE 6.—Changes in the Blood in a Case of Duodenal Intoxication Following Gastro-Enterostomy

Date, 1923	Various constituents of serum, mg. for each 100 c.c.					Various constitu- ents of plasma, mg. for each 100 c.c.		Blood urea, mg. for each 100 c.c.	Intake		Output
	Sodium	Potassium	Calcium	Magnesium	Phosphorus	Chlorid	Carbon dioxid combin- ing power, per cent by volume		Sodium chlorid, gm.	Water, c.c.	Urine, c.c.
11-11	336					271	109	282	12.6	3800	Anuria*
11-12	336	15.8	8.0	3.7		350	86	316	20.3	4400	700
11-13	304	13.0	8.4	2.8	9.0	384	77	297		2400	1970
11-14						420	70	288	10.0	3125	2200
11-15									6.5	3000	2500
11-16						485	66	190	12.0	2500	2840
11-17									8.0	3510	3245
11-18									10.0	3580	2990
11-19	350	13.6	9.3	2.7		570	52	86	10.0	3840	3370
11-20	371								3.0	3540	3570
11-21		16.3	9.2	2.6		615	50	54			3000
11-22											2900
11-23											2600
11-24											2200
11-25											
11-26	368	16.5	9.1	2.7	2.1	605	55	27			
Normal values	335	20.5	10.5	2.0	2 to 3	585	65	25			

* Emesis 1560 cc.

be grouped as (1) those in which there is nitrogen retention only (hypertrophy of the prostate gland, polycystic kidney and certain forms of toxemia); (2) those in which edema is associated with secondary renal changes (nephrosis and cardiac dropsy); (3) those in which nitrogen retention is associated with edema and primary renal changes (acute, subacute and chronic nephritis and infections of the kidney), and (4) those in which there is edema of extrarenal origin (cirrhosis of the liver, Banti's disease and polyserositis).

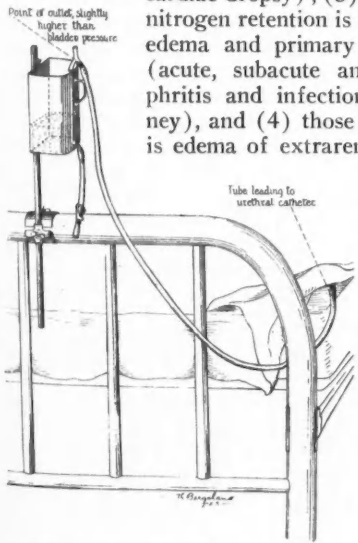


Fig. 4.—Apparatus for gradual decompression of distended bladder (Von Zwalenburg).

NITROGEN RETENTION

Hypertrophy of the Prostate Gland and Polycystic Kidney.—In obstruction of the lower part of the urinary tract resulting from hypertrophy of the

prostate gland there is retention of urine and distention of the bladder, and later the accumulation of an excess of urea and creatinin in the blood. This condition, if uncomplicated, is rarely associated with edema. In the treatment of hypertrophy of the prostate gland, the most important considerations are: (1) the forcing of water, (2) the gradual decompression of the distended bladder, (3) the restriction of proteins, (4) the temporary or permanent removal of the obstruction (cystostomy or prostatectomy), and (5) care of infection. In hypertrophy of the prostate gland and in polycystic kidney the forcing of water is often the most significant therapeutic consideration. The importance of gradual de-

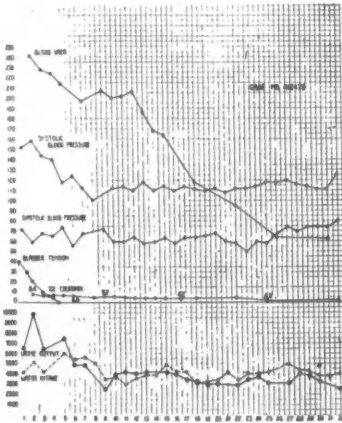


Fig. 5.—Time consumed in lowering of tension of the bladder and decrease in blood urea and blood pressure (Bumpus and Foulds).

TABLE 7.—Loss of Weight by Use of Sugars; Dehydration Period

Sugar	Dog	Loss of body weight		Loss of urine		Temperature change, ° C., rectal
		Kg.	Per cent	Body weight, per cent	C.c. for each kg.	
Saccharose	1	0.9	8.57	9.3	93	39.3 to 38.9
		1.1	10.6	10.7	107	38.8 to 38.9
	2	2.15	12.6	10.5	105	38.9 to 38.8
	3	1.3	14.0	10.5	105	39.8 to 39.2
	4	0.9	9.2	9.4	94	39.4 to 40.2
	5	0.9	9.3	9.7	97	39.6 to 39.1
	6	1.4	12.7	9.6	96	38.9 to 38.4
	7	1.68	11.5	10.0	100	39.4 to 40.1
	8	1.2	11.2	9.6	96	38.8 to 39.6
	9	1.3	11.4	8.9	89	38.8 to 39.0
	Average		11.1	9.8	98	Maximal rise 0.8
Glucose	10	1.4	10.6	7.0	70	38.8 to 39.3
	11	1.6	11.9	7.0	70	38.1 to 39.6
	12	1.5	11.2	7.7	77	39.2 to 40.1
	13	1.3	11.2	9.6	96	38.8 to 39.8
	Average		11.2	7.8	78	Maximal rise 1.5

compression should also be emphasized. This may be accomplished by the simple apparatus (Fig. 4) developed by Doctor Von Zwalenburg. The remarkable diuresis and the effect on the blood urea and on blood pressure is shown in Figure 5.

Certain Types of Toxemia.—There are many types of toxemia in which the administration of water alone or of water with salt and glucose may prove life-saving. Acute toxic nephrosis subsequent to operation is not infrequently encountered. Figure 6 graphically portrays the course of events in such a case. Following operation the output of urine decreased and the blood urea rose. Fluids were forced with a marked decrease in the level of the blood urea, but with development of moderate edema. This, however, was readily overcome by the use of euphyllin and a salt-free diet.

Pressure factors are often involved in the precipitation of toxemia. Thus the sudden release of pressure in a distended urinary system results often in a profuse urinary output for a few hours, followed by oliguria and uremia. The

administration of salt and glucose intravenously then may be indicated. Exactly analogous toxemia often results from the sudden relief of pressure in a distended biliary system. This is shown in Figure 7. The blood urea mounted rapidly following operation from a normal level to 150 mg. for each 100 c.c. Following the intravenous administration of 1 liter of 10 per cent solution of glucose the level of the urea rapidly became lower as the jaundice cleared.

Another striking example is found in toxemia accompanying high intestinal obstruction. As was shown independently by Haden and Orr and by Brown, Eusterman, Hartman and Rowntree, this is associated with a high level of blood urea, a low level of blood chlorid and frequently by alkalosis. During the last five years numerous cases of this type of toxemia have been treated by the intravenous administration of water, salt and glucose, which acts almost as a specific. In Table 6 is given the record of a case reported by McVicar in which the toxemia yielded steadily and progressively to this form of treatment.

Another type of toxemia that demands diuretics is found in Addison's disease. The course of events in one such case is presented in Figure 8. At first the oliguria was overcome by the administration of large quantities of solution

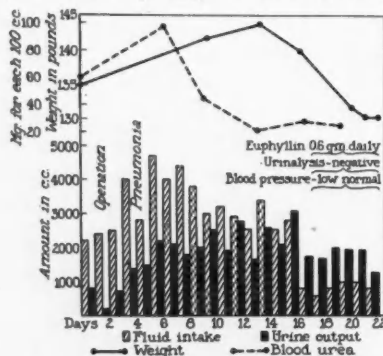


Fig. 6.—Results of treatment in a case of toxic nephrosis following operation (Bannick and Keith).

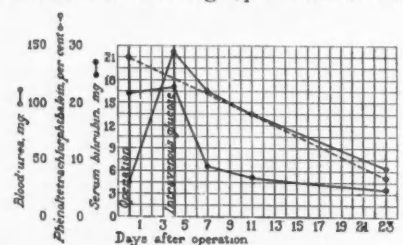


Fig. 7.—Effect of intravenous administration in combating acute toxemia resulting from surgical relief of pressure in a distended biliary system.

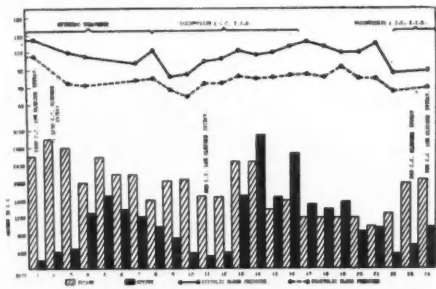


Fig. 8.—Treatment in a case of toxemia in Addison's disease.

of glucose intravenously used in combination with the Muirhead regimen. Subsequently the blood pressure became low and oliguria was present. Glucose was again given together with pitressin (vasopressin).^{*} Pitressin used in diabetes insipidus for its antidiuretic effect, seemed to act definitely as a diuretic in this case of Addison's disease. After it was discontinued oliguria recurred

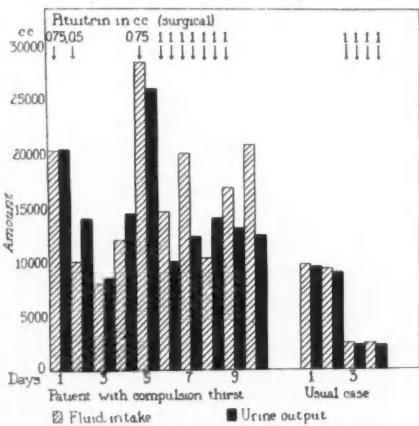


Fig. 9.—Effect of pituitrin in diabetes insipidus.

and was overcome a second time with pitocin, and glucose.

Water intoxication bears an interesting relation to the excessive use of water as a diuretic. In forcing water the question might be asked as to whether this constitutes a danger. Edema develops at times and water intoxication may also

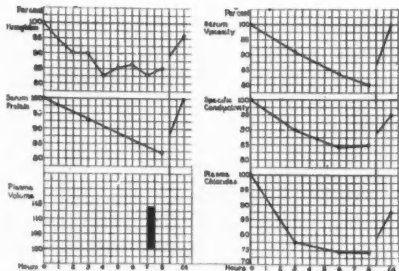


Fig. 10.—Changes in blood following administration of water.

^{*} Studies with recently isolated pituitary extracts. Proceedings Staff Meetings, Mayo Clinic, 1928, III, 229.

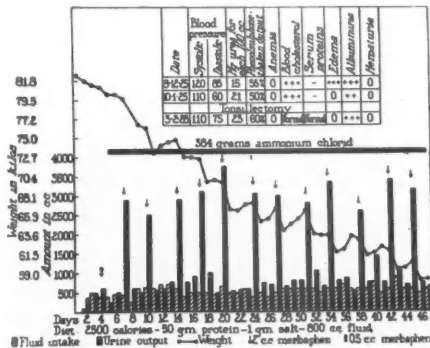


Fig. 11.—Effect of ammonium chloride and merbaphen in a case of nephrosis with edema (Bannick and Keith).

occur. This condition was first recognized by Weir, Larson and Rowntree in connection with diabetes insipidus. Figure 9 shows the excessive intake and output in a case of diabetes insipidus with compulsion thirst and the effect of the subcutaneous administration of pituitrin in this and in the usual case. This is of peculiar interest as

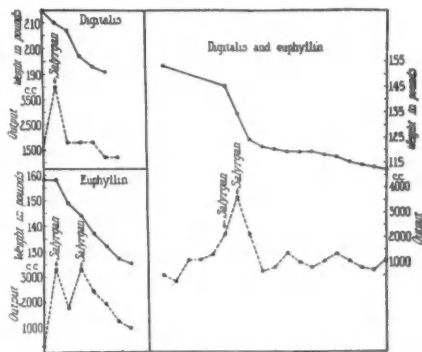


Fig. 12.—Effect of treatment in three cases of myocardial insufficiency.

the case was complicated by epileptiform convulsions which were thought to be induced by excessive intake of water. Since then another patient has manifested similar symptoms under excessive intake of water.

In the study of water intoxication, Greene and Rowntree have shown that there is a possibility of diluting blood through excessive intake of water. The extent to which dilution occurs as determined by measurements is shown in Figure 10. Under these conditions the plasma increased approximately 15 per cent. The content of salt in the plasma was decreased much more markedly than is indicated by the dilution. This was found to be a factor in the production of water intoxication.

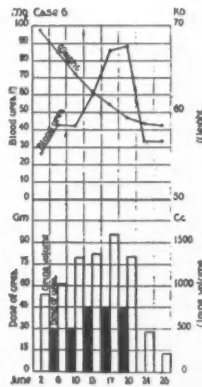


Fig. 13.—Diuretic effect of urea (Crawford and McIntosh).

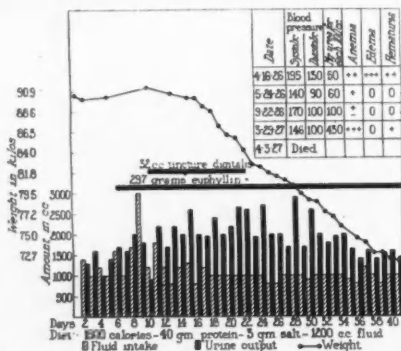


Fig. 14.—Treatment with digitalis and euphyllin in a case of nephritis with edema and uremia (Bannick and Keith).

In contrast to the dilution of plasma, Keith has demonstrated the extent to which dehydration can be affected through the use of sugar (Table 7). Through the intravenous administration of hypertonic solution of sugar he reduced the weight of dogs to the extent of 11 per cent or more, without any significant effect on the temperature of the animal.

EDEMA ASSOCIATED WITH RENAL CHANGES

Nephrosis.—This disease usually is associated with edema and albuminuria. It was formerly included in the condition known as chronic parenchymatous nephritis. The changes in the kidney, however, are degenerative, not inflammatory, and hence this disease was called nephrosis by Müller. Aschoff and others have raised the question as to whether this is a disease of the kidney or a general disease in which the kidney participates.

In addition to albuminuria and edema there is decrease in the proteins of the blood and increase in the values for lipoids and for globulin in the plasma. Hypertension and other cardiovascular changes commonly observed in nephritis are lacking in pure nephrosis, and recovery is relatively common. Mixed forms, as described by Volhard and Fahr, with some features of glomerular nephritis, are common. These usually progress and eventually may present the typical picture and termination of glomerular nephritis.

The edema in nephrosis has been, as a rule, difficult to control. Much better results are now being obtained with the newer diuretics. Merbaphen was first used as a diuretic in cardiac dropsy by Saxl and Heilig, in Wenkebach's clinic in Vienna. The administration of ammonium chlorid by mouth in combination with the intravenous use of merbaphen, a method introduced by Keith, has given excellent results in the treatment of nephrosis. The results in one of these cases is shown in Figure 11.

The statement frequently has been made that control of the edema does not constitute cure. This, of course, is obvious. Yet, from the standpoint of both the patient and the physician the control of the edema is a definite triumph. Al-

though albuminuria persists the patients are able to be up and about and are rehabilitated to a considerable extent. Exacerbations occur from time to time, but a large proportion of these patients recover eventually.

Other forms of treatment have been advocated, of course, in nephrosis. Epstein has advised a diet high in protein and low in fat, and good results have been obtained on this regimen by several workers. I believe, however, that the low level of protein, although important, is not the sole factor in the causation and persistence of the edema, since induced or spontaneous diuresis has been observed at times without any demonstrable change in the protein content of the blood. Restriction of salt and water obviously is important. Thyroid extract also has been advocated by Eppinger and later by Epstein. It is given in doses of about 1 to 4 gm. a day. I have not found this a very satisfactory form of treatment, and it does not compare in results with that in which ammonium salts and merbaphen are used. Urea has been employed with success in some cases at The Mayo Clinic, especially in the treatment of children.

Myocardial Insufficiency; Chronic Passive Congestion.—As myocardial insufficiency progresses, edema is frequently established, at first the dependent parts are affected, later the abdominal and pleural cavities are involved and the condition often ends in general anasarca. The circulation becomes more and more embarrassed and the function of all the viscera becomes more and more faulty. Along with the other organs, the kidneys fail. In the later stages retention of nitrogen may appear, with increase in the level of the blood urea. In pure passive congestion of the kidney, however, blood urea values of more than 50 to 100 mg. are extremely rare. The most important consideration is reestablishment of circulation. In this connection derivatives of digitalis and caffeine are most useful. Rest and restriction of water and salt also are indicated. Urea, merbaphen and ammonium salts are valuable in treatment. Figure 12 shows the results in three cases.

The first patient was treated with digitalis, with the addition of one dose of salyrgan. Part 2 of Figure 12 shows the effect, in another case, of treatment with euphyllin and the addition of two doses of salyrgan. In the third part is shown the effect of treat-

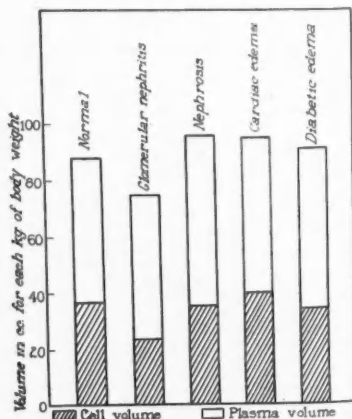


Fig. 15.—Volume of blood plasma and cells in various edema states.

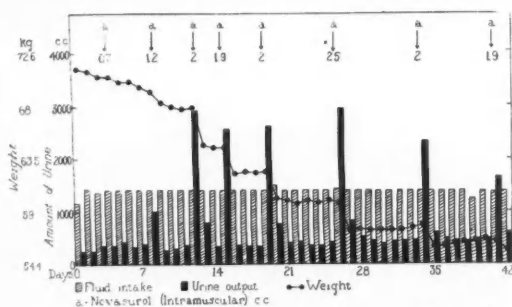


Fig. 16.—Fluid balance, diuresis and loss of weight under merbaphen in a case of Banti's disease with cirrhosis of the liver.

ment of a case with digitalis and euphyllin with the addition of two doses of salyrgan.

In the edema of myocardial insufficiency, urea is very effective as a diuretic. The nature of the results with doses of 60 to 90 gm. each day is shown in Figure 13. It has been advocated recently by Crawford and McIntosh. They have asked the simple question: Why is urea not used more frequently? The fear of uremia is, in all probability, the answer. As physicians, we associate the high level of blood urea with uremia and consequently have an unwarranted prejudice against the use of this valuable agent.

COMBINED NITROGEN RETENTION AND EDEMA

A combination of edema and uremia frequently is encountered in acute, subacute and chronic nephritis and infections of the kidneys. In acute nephritis emphasis should be laid on absolute rest in bed, restriction of activity, control of diet and maintenance of warmth. Diuretics may be necessary. If used at all, purin derivatives and hypertonic solutions of sugar are perhaps best. Foci, such as infections in the tonsils or sinuses, may demand attention. In acute, subacute and chronic cases euphyllin is often of decided value, and in older persons digitalis may prove helpful. The effect of such a regimen is depicted in Figure 14. The question is often raised as to which should receive chief consideration, the edema or the retention of nitrogen. This of course depends on the individual case, but as a working rule I have felt that in many instances the accumulation of urea should be controlled even at the expense of inducing edema. This edema can be dealt with subsequently by diuretics or by posture. In some instances it is necessary to place the patient in a jackknife position with the head and feet high, thus allowing the fluid to accumulate within the abdominal cavity, where it can be removed readily by paracentesis.

In former days, edema was ascribed to hydremic plethora. Glomerular nephritis is not accompanied, as is ordinarily thought, by hydremic plethora but rather by a small volume of blood and a normal volume of plasma (Fig. 15). Nephrosis, on the other hand, is accompanied by a slightly increased blood volume with definite increase in plasma volume. Cardiac dropsy shows slightly increased blood volume with, in many

instances, increases in the cell volume. Diabetic edema is accompanied by plasma volume and blood volume which are essentially normal. This would seem to indicate that the plasma does not play an active rôle, but is rather a passive witness of the conflict between the tissues and the kidney.

EDEMA DUE TO EXTRARENAL FACTORS

Recently considerable progress has been made in the control of ascites in cirrhosis of the liver, Banti's disease and polyserositis, through the use of merbaphen and ammonium salts. When Rowntree, Keith and Barrier first employed merbaphen for this purpose we were influenced by the European literature which seemed to indicate that its use in the presence of disease of the liver was fraught with danger. However, when due care is used, the results are gratifying in the extreme. Figure 16 indicates the results obtained in the first case of Banti's disease with cirrhosis. The patient recovered, but died about four years later of hemorrhage from esophageal varices.

The problems of treatment in cirrhosis of the liver are unusually well exemplified in Figure 17, which shows the results of treatment in the same patient at several admissions. On the first visit, excellent diuresis was obtained through the use of merbaphen. On the second admission ammonium chloride was used in addition to merbaphen, with excellent results. His condition on the third admission was not charted because he was suffering from anemia due to hemorrhage and required transfusions only. On the fourth admission the edema was not a striking problem. Three injections of merbaphen and the use of ammonium chloride readily caused its disappearance, but two transfusions also were given. On the last visit, edema was not marked, but he did not respond to merbaphen, ammonium chlorid or hydrochloric acid. Three transfusions were given. The patient died a year later of anemia and inanition. The real problem now in the treatment of cirrhosis of the liver is hemorrhage. In the majority of cases, ascites can be controlled with relative ease. In thirteen of the first twenty-six cases observed in The Mayo Clinic in which edema was satisfactorily controlled, death occurred within three years from esophageal hemorrhages. Prevention of varices in the esophagus and the attending hemorrhage

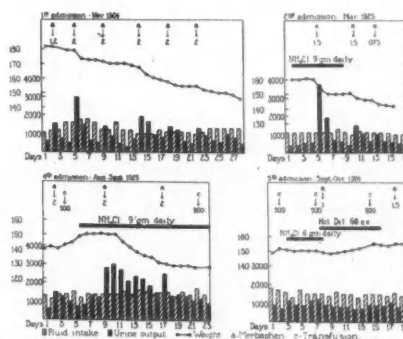


Fig. 17.—Results of treatment with merbaphen in six cases of polyserositis (Snell).

would appear to be a mechanical surgical problem involving control of the left coronary vein leading to the esophagus. It demands surgical consideration.

Ascites and anasarca often constitute the most difficult problems in polyserositis. In the majority of instances, immediate results can be obtained through the use of merbaphen and ammonium salts. The results of treatments with merbaphen in a series of six cases were reviewed by Snell (Fig. 18). In the subsequent control, under conditions at home, ammonium chlorid or ammonium nitrate may prove of value.

With the advent of the new diuretics a better selection than formerly is offered and better results are being obtained than ever before. There is still room for much progress in the treatment of edema. This progress may come through channels other than the administration of drugs such as are now in use. Some of the possibilities which have been suggested are denervation of the kidney by section of the lesser splanchnic nerves and stripping of the renal vessels, and the development of an active diuretic substance from the hypophysis or from the mammillary bodies. In this connection it may be noted that Bourquin has recently found it possible to get an extract from the mammillary bodies of dogs suffering from experimental diabetes insipidus which markedly increased the urinary output when injected into normal dogs.

COMMENT

I have discussed the most important diuretics and the various pathologic states in which they are indicated. But that is only the beginning. In practice, as we all know, each patient must be considered individually and each case of edema represents a distinct problem. I close, as I began, with a statement of Sydenham's with which I am sure all are agreed:

"The chief weakness of medicine is not our ignorance as to the ways and means by which certain indications may be satisfied, but our ignorance of the particular indications that thus want satisfying. How I can make a patient vomit,

and how I can purge or sweat him, are matters which a druggist's shopboy can tell me off-hand. He can tell me, too, how to cool a man when he is heated. When, however, I must use one sort of medicine in preference to another, requires an informant of a different kind, a man who has no little practice in the arena of his profession."

The Mayo Clinic, Rochester, Minn.

CORONARY ARTERY DISEASE*

WITH REPORT OF CASES

By ROBERT WILLIAM LANGLEY, M. D.
Los Angeles

DISCUSSION by Harry Spiro, M. D., San Francisco;
Franklin R. Nuzum, M. D., Santa Barbara; Eugene S. Kilgore, M. D., San Francisco.

INCREASING interest in the study of coronary artery disease during the last twenty years has led to more accurate diagnosis and to the early recognition of cases. The electrocardiograph has been particularly helpful in ruling out "acute indigestion," gall-bladder disease, and other vague abdominal pains. One is now able to cast a better prognosis and possibly prolong a patient's life by more accurate observation.

The cases given below represent a definite group of individuals who have survived attacks of acute occlusion of smaller branches of the coronary arterial system.

REPORT OF CASES

CASE 1.—Male, age sixty-six. On April 2, 1927, this patient was taken ill suddenly with a severe knife-like pain in the chest which was entirely substernal. The man felt as if he were going to die. He began to perspire and thinks he lost consciousness. He was a business man who had led a sedentary life for years and whose habits were moderate. On questioning him it was found that he had never had any serious illnesses that he could remember, and his only complaint had been a slight increased shortness of breath on unusual exertion during the last year.

The patient was examined in his office within one-half hour of the onset, and the pain relieved completely after a hypodermic injection of one-quarter grain of morphin sulphate. There was considerable pallor and cyanosis of the lips and ears, and perspiration was profuse. The pulse was 40 and the blood pressure, 146/90. No murmurs were heard and the heart was not enlarged to palpation. The patient was taken to the hospital immediately and an electrocardiogram made. The tracing revealed inversion of the T wave in Leads II and III, incomplete A-V block with migration of the pace-maker (Figure 1a). During this time the patient was in an orthopneic position constantly. Three grains of caffein sodium-benzoate was given every three hours during the day and, when necessary, at night. Morphin sulphate grains one-sixth was given twice. No digitalis was used. At the end of this period another tracing was made which indicated that the pace-maker had become stabilized. The T wave inversion was still present, showing a greater suggestion of the coronary arching as described by Pardee (Fig 1b). Several letters from the patient indicate that he has had slight precordial constriction on a few occasions during the last ten months, but has been otherwise perfectly well.

CASE 2.—Male, age sixty-one. In December 1926, the patient was referred by his son, a doctor, for an electrocardiogram. The tracing was without significant features in any lead and a report of a normal

* Read before the Innominate Society of Los Angeles, February 8, 1928.

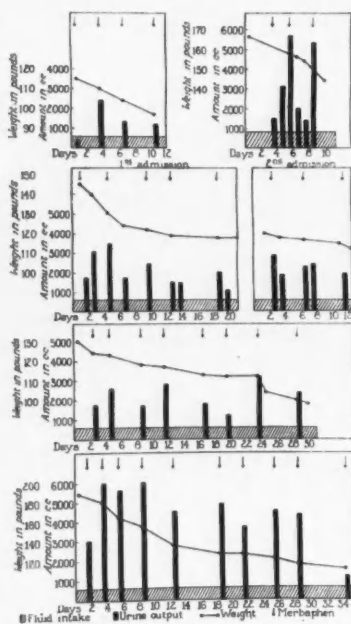


Fig. 18.—Results of treatment on four admissions of a patient with cirrhosis of the liver.

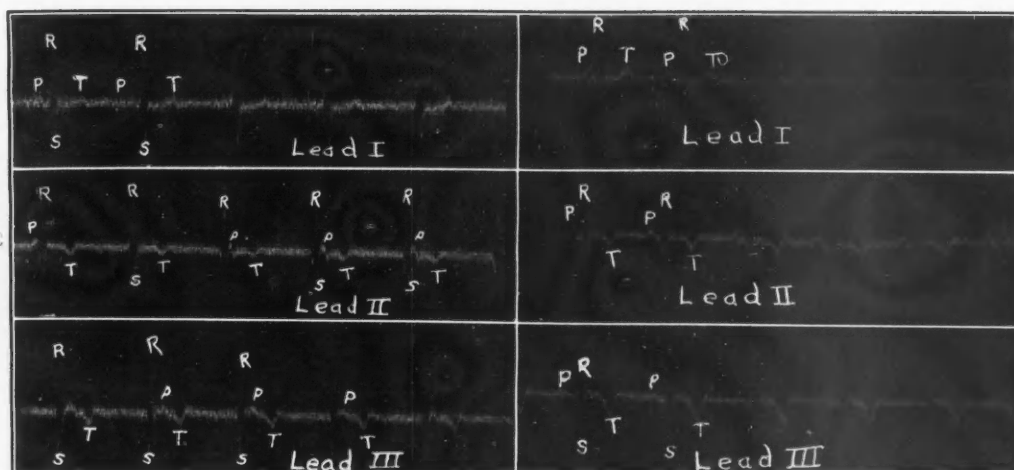


Fig. 1a (Case 1)

Fig. 1b (Case 1)

tracing was returned. The patient was a man who had always been in good health except for occasional attacks of what he referred to as indigestion. There had been no attacks of precordial pain but frequent attacks of pain on the right side below the diaphragm, and some other evidences of gall-bladder inflammation. In April 1926, there was an attack slightly more severe than at any previous time and again in July 1926, during which time there was some precordial pain. In August an attack became so severe that it left no doubt that the pain was cardiac in origin. He was taken to the hospital and an electrocardiogram showed a decided inversion of the T wave in all three leads and a high grade incomplete A-V block (Fig. 2b). Two months of absolute rest in bed was carried out, with the patient in the orthopneic position. Caffein was given routinely and morphin grains one-quarter on two occasions. During two months there was no recurrence of pain in the chest and the patient felt quite well except for occasional attacks of palpitation. On examination the blood pressure was 130/90, pulse 78, temperature 101, and the white blood count 14,500. Another electrocardiogram taken at the end of two months showed a restoration of the normal P-R interval, inversion of the P waves, but the T wave had become positive again in all leads (Fig. 2c). Frequent observation of the patient during the last two months reveals occasional

slight attacks of abdominal discomfort, and a history of mild atonic colitis with belching of gas.

Case 3.—Female, age sixty-six. On the eve of April 2, 1927, the patient was seized with a sharp stabbing pain in the chest which continued during most of the night. She was seen at 7 a. m. the following morning, and during examination suddenly felt that she was dying. She lost consciousness, became pale as in death, had a convulsion, became pulseless and apparently was dead.

A hypodermic injection of 20 minims of adrenalin was given intravenously, but probably before it had time to act the patient became conscious again and the pulse became perceptible. The heart action was increased in force and the rate quickly rose to 100 per minute. The patient was removed to a hospital, where the electrocardiogram showed a high grade incomplete heart block with inversion of the T wave in all three leads. The coronary arching was particularly well shown in the second and third leads, associated with left ventricular preponderance and severe myocardial damage (Fig. 3a). On physical examination the blood pressure was 100/90, temperature 99 to 100 during the first week, pulse 40, and white blood count 16,400.

This patient was kept at absolute rest in the orthopneic position for two weeks and the usual treat-

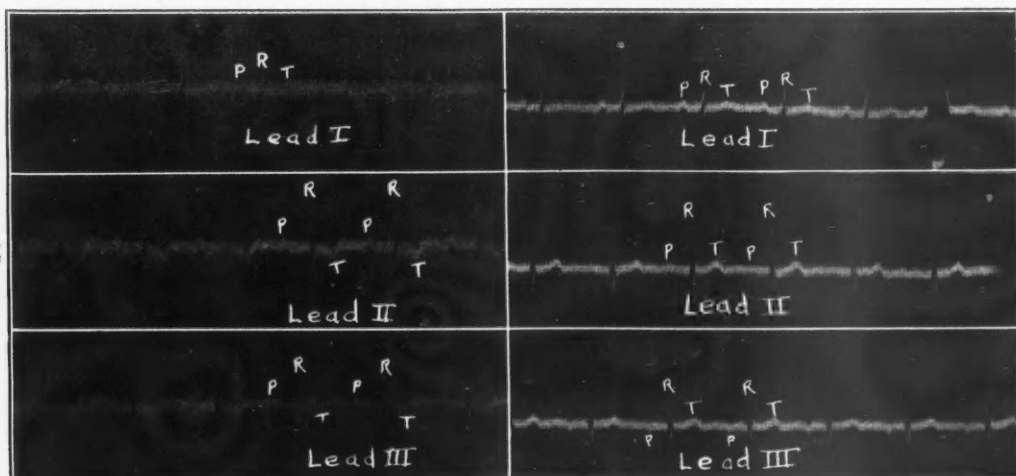


Fig. 2b (Case 2)

Fig. 2c (Case 2)

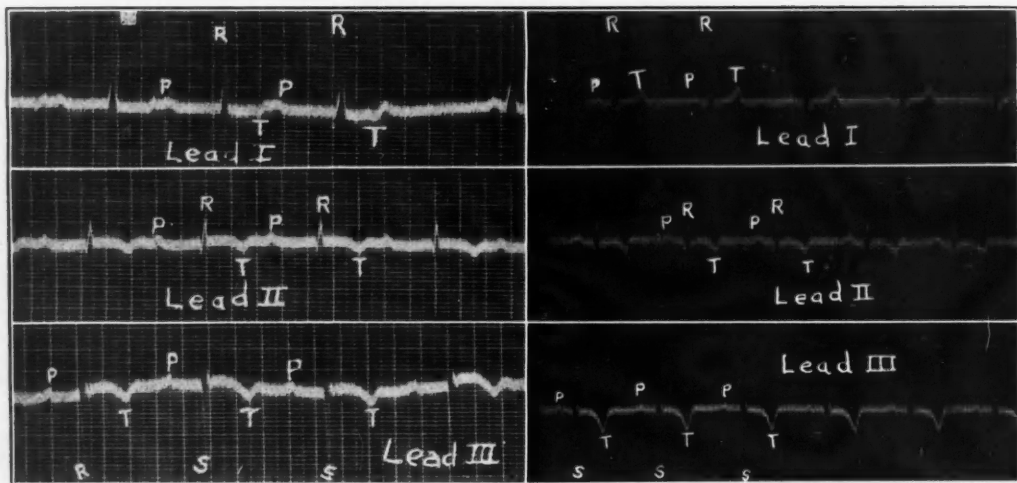


Fig. 3a (Case 3)

Fig. 3b (Case 3)

ment as given above. During this time there was never any recurrence of precordial pain or cyanosis, but occasional attacks of palpitation. After six weeks of further rest in bed at home, another electrocardiogram was taken which revealed restoration of the normal sinus rhythm with disappearance of the A-V block. The T wave is definitely positive in Lead I, but inversion still remains in Leads II and III (Fig. 3b).

CASE 4.—Male, age forty-nine. This patient was first observed in March 1927, while in the hospital for an acute toxemia. There had been some precordial distress for several weeks, but no definite pain or dyspnea. Palpitation had been a feature. In October 1927, the patient was seen again, after a severe attack of pain in the chest which radiated to both arms and under the left shoulder. This attack came on immediately after climbing a flight of stairs. On examination he was quite pale, perspiring freely, slightly cyanosed and perceptibly short of breath. The pulse was soft and compressible, irregular and 100 per minute. The heart tones were indistinct and no murmurs were heard either at the apex or base. The rhythm was interrupted every fourth beat by premature contractions and the blood pressure was 132/98. The heart was not enlarged to percussion. After four weeks of rest in bed, the patient was transferred to the hospital where an electrocardiogram revealed inversion of the T wave in the second and third leads with a suspicion of the coronary curve associated with notching of the Q R S complex in all leads and left axis deviation (Fig. 4). This man is now attending to his practice, but limiting his work to office consultation, and has had no severe attacks during the last three months.

CASE 5.—Male, age sixty-three. The patient was seen on May 2, 1927, several hours after a severe attack of precordial pain. The attack lasted about an hour until a physician was called who recognized the symptoms as cardiac, and administered one-quarter grain of morphin sulphate. Relief was obtained almost immediately. The patient had been healthy until the last few months, when several attacks of precordial distress were noticed, particularly in the early morning.

On examination the lips were slightly cyanosed, the skin pale, pulse 80, blood pressure 132/80, vital capacity 62 per cent. There was slight enlargement of the heart to the left, no apical or basal murmurs and no cardiac irregularity.

Rest in bed for four weeks was advised and during this time there was no recurrence of symptoms. Fol-

lowing the rest period an electrocardiogram revealed inversion of the T wave in the second and third leads and notching of the Q R S complex in all leads (Fig. 5). The patient has been quite comfortable for eight months, but has restricted his activity considerably and takes small doses of theobromin daily.

CLINICAL COURSE

The clinical picture presented by the above cases is that of severe collapse associated with intolerable pain in the chest, referred to one or both arms, boring, knife-like, tearing or gripping, and sometimes referred to as a choking pressure. Nausea and vomiting may be present. Cyanosis is usual and may be associated with pallor and cold sweats. Fever and leukocytosis are frequently found during the first few days. Dyspnea is a prominent feature and eventually edema of the lungs may develop with spitting of blood. Convulsions may occur (Case 3). Physical examination is frequently of little aid. The heart may or may not be enlarged, and the blood pressure and pulse are variable factors. Occasionally alternation of the pulse is found and the heart tones are frequently very poorly heard and there may be no murmurs. A pericardial friction rub is of diagnostic importance, but is not always heard. When present it is more apt to be heard twenty-four hours after the onset.

In most instances a large coronary artery is occluded and death is instantaneous or at least supervenes within a few hours. In the cases mentioned above, the onset and symptoms were most severe, but instead of collapse and death the patients gradually improved and all are now living and well, after periods varying from two months to a year. Probably a small arteriole was occluded in these instances and small areas of infarction formed which were not large enough to embarrass the heart sufficiently to cause death.

PATHOLOGY

The pathology is generally that of sclerosis and atheroma of the coronary vessels. The descending branch of the left coronary is more seriously involved in the majority of cases. Infarcts gener-

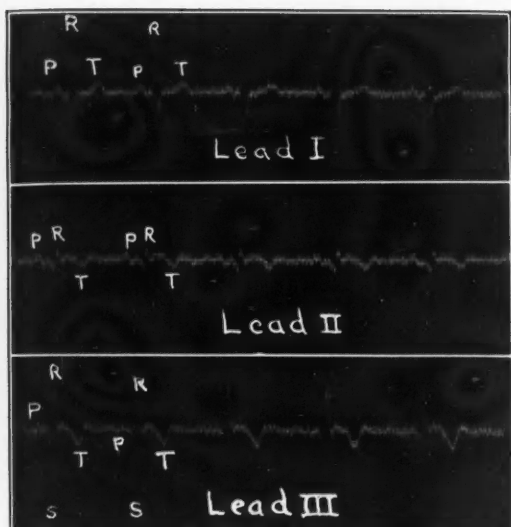


Fig. 4 (Case 4)

ally occur in the anterior two-thirds of the left ventricle. If the area of infarction has been large and the inflammation extensive, the pericardium may be found adherent at the site of infarction.

Fatty degeneration, so-called, is not a factor in the production of these changes. Probably the fatty degeneration, so frequently referred to in the past, is merely the myocardial degeneration resulting from coronary sclerosis with small occlusions. At autopsy the heart will generally show some hypertrophy.

Certain etiological factors should be considered in passing. The causative factors of arteriosclerosis and hypertension are frequently those of this condition. The most important chronic infections include syphilis, rheumatic carditis, and ulcerative endocarditis. Minor factors which may be responsible for a precipitation of the symptoms are: extreme physical exertion calling for a sudden powerful contraction of the heart, such as the carrying of heavy weights, coughing, defecation, coitus. Great excitement and emotional upsets, and overeating should also be placed in this category.

COMMENT

The cases given above confirm the diagnosis of coronary artery disease both clinically and from the standpoint of the electrocardiograph. In only one case had digitalis been given, that of Case 2, and in this case no digitalis had been taken within one week of the electrocardiographic tracing. A definite inversion of the T wave is found in the records of certain individuals who have been taking this drug, and the effect is still frequently present even after ten days. The fact that a later tracing showed a normal picture may indicate first, that the attack was an acute coronary spasm, and second, that digitalis was actually a disturbing factor in the electrocardiographic tracing.

It would seem from a study of these cases that coronary artery disease gives rise to a certain clinical picture and should be more easily recog-

nized in the future by the aid of the electrocardiograph.

When an individual past forty years of age has an attack of so-called acute indigestion following a heavy meal or unusual physical or mental exercise, the possibility of coronary artery disease must first be considered. The diagnosis can be made only after a careful history and complete cardiac study.

1052 West Sixth Street.

DISCUSSION

HARRY SPIRO, M. D. (870 Market Street, San Francisco).—I find it more than ordinarily difficult to add any information to what Doctor Langley has already stated because in a more than ordinarily concise manner he has covered the subject of coronary artery disease. Furthermore, I would like to congratulate him on his results. He is far more fortunate than I am.

The questions of diagnosis as Doctor Langley has explained them will always be of prime importance. It surely must be disconcerting to the conscientious physician to make a diagnosis of acute indigestion and then have his patient suddenly die. The differential diagnosis on the other hand, between coronary artery thrombosis and acute gall-bladder disease, is not always easy and a mistake is forgivable, especially so if one makes a diagnosis of coronary artery thrombosis when it is only an acute gall-bladder disease. The most disconcerting thing about the whole question of diagnosis of coronary artery thrombosis is the indefiniteness of a physical examination, as Doctor Langley has pointed out. The heart may be of average size, the rhythm of the heart, particularly as found at the radial artery, may be perfect, the heart sounds may be clear, and yet the patient be in imminent danger of death. This is what makes the history of such marked importance. Here is the one case in which, if the symptoms are typical, all laboratory tests, physical examination, x-ray examinations, or electrocardiograms, may be disregarded to let the patient's statements rule. The proof of the above statement is the fact that a patient may have the symptoms typical of coronary artery stroke such as described by Doctor Langley, may die a cardiac death, and yet postmortem examination disclose very little. One of the principal reasons is that these patients may die because a very small branch of the coronary artery may be suddenly occluded and this sudden occlusion so irritate some part of the ventricular muscle as to produce ventricular fibrillation and thus instant death. I believe it is generally recognized that the most frequent cause of death in angina pectoris is ventricular fibrillation.

The question as to whether one should use digitalis or vasodilators is another problem which is under active discussion. I believe that if a physician is actually convinced that a patient has an acute coronary artery stroke, particularly if there is associated

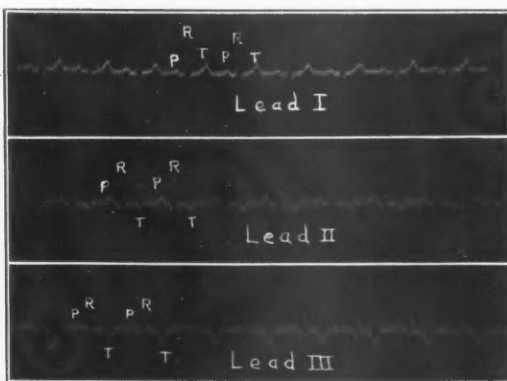


Fig. 5 (Case 5)

with the symptoms a marked fall in blood pressure, that he is then justified in the use of digitalis. If the heart can be supported and the circulation maintained long enough, there is a chance for the patient to make a recovery. On the other hand I feel that if the patient gets any relief from the use of vasodilators, these should be used either alone or in conjunction with digitalis. I regard it as particularly ominous for a patient who has had symptoms of coronary artery stroke to develop an arrhythmia of any type during the acute phase. These patients appear to be doing fairly well, have no more pain, and die very, very suddenly.

Another dangerous type is one in which the patient has recovered from his attack of pain, feels more than ordinarily well, has no distress of any kind, and yet his pulse rate is fast, over 100. These patients frequently drop dead the first time you let them stand up or go to the toilet. If a patient has had symptoms of coronary artery stroke, has apparently recovered and in the first few weeks of his recovery has a fast pulse rate, over 110, keep him in bed.

Shall a man smoke or shall he not? I believe nicotine is a cardiac muscle irritant; for that reason it is probably best for the patient to discontinue the use of tobacco and only resume its use very gradually, if at all.

✱

FRANKLIN R. NUZUM, M. D. (Santa Barbara Cottage Hospital, Santa Barbara.—I, too, would like to add my commendation of Doctor Langley's paper. I would like to add a further word concerning the changes in the heart muscle that follow an acute blocking of one of the coronary vessels. An anemic infarct is the result. The size of the infarcted area depends on the size of the occluded vessel. A very firm, strong heart muscle within twenty-four to forty-eight hours following an occlusion becomes at first light yellow in color and later dark red; its softness is surprising, and the ease with which one may thrust his finger or a blunt probe through such an infarcted area makes one wonder why many more of these patients do not die of a rupture through the infarcted area.

In some more than six hundred reported instances in the literature, of rupture of the heart wall, the area of infarction has, in over 95 per cent, involved the anterior descending branch of the left coronary artery, *i. e.*, that vessel which supplies the anterior wall of the left ventricle and a portion of the ventricular septum. In these six hundred instances death resulted from a rupture through the infarcted area, and the exact location of the infarct and the obstruction in the coronary artery were demonstrated by postmortem examination. Since the anterior wall of the left ventricle is usually infarcted, the fibrinous adhesions which form over this area rub upon the anterior surface of the pericardial sac, producing a friction sound. This friction, when searched for, is very frequently present. It develops ten to eighteen hours after the occlusion of the coronary vessel. It usually disappears within ten to twenty-four hours after it first becomes audible. When present it is the most striking point in the physical examination in proving the diagnosis of a coronary occlusion. Temperature, a leukocytosis, and a so-called coronary T wave in the first or second lead of the electrocardiogram complete the clinical findings and indicate a large area of infarction of the myocardium.

When small branches of the coronary arteries are occluded, the areas of infarction may be minute. These instances are often more difficult of diagnosis, but are equally important clinically, since, as has been stated, ventricular fibrillation may follow, and this type of disturbed rhythm results in death.

That rupture of large infarcted areas occurs more commonly than was generally believed is becoming recognized. I personally have nine pathological specimens in which such a rupture occurred. In each of these instances the patient had gotten out of bed within twenty-four to forty-eight hours following the vessel occlusion and death was sudden.

The ability of nature to repair such an infarcted area is equally impressive. Large, firm, fibrous scars,

involving particularly the left ventricular wall, in some instances measuring several centimeters in length and breadth, attest to the importance of keeping such a patient at bed rest until complete fibrosis has had time to take place.

✱

EUGENE S. KILGORE, M. D. (490 Post Street, San Francisco).—Clinical interest in coronary thrombosis is rightly focused mainly on diagnosis; and it is gratifying that intelligent study now usually establishes the diagnosis during life, whereas a few years ago it was very exceptional for this to occur. Doctor Langley has illustrated the value of electrocardiography and the usual symptoms and physical signs.

With little more additional data the electrocardiogram or the pericardial friction sound may establish the diagnosis. More frequently, however, a careful study of symptoms alone will be nearly or quite decisive, and conversely, and which is most important, a superficial attention to symptoms is usually responsible for the occasional costly error of mistaking coronary thrombosis for an acute abdominal condition.

Pain is often absent, or it may be mild or excruciating. Most commonly substernal, it may be precordial, diffusely over chest and back, or occasionally only epigastric. It may or may not radiate—usually to the left arm, especially under the arm to the elbow, wrist or radial distribution in the hand; or to the right arm or both arms, the neck, jaw, or occiput. It is variously described (according to preconceptions of the patient) as "pleuritic," "indigestion," etc.; but more particular questioning will often bring out the quality of pressure—"vise-like," "constriction about the wind-pipe," "internal gas pressure," "petrified feeling," etc., or it may be simply indescribable. It is not colicky. It is not lightning-like in onset, but usually has a distinct crescendo period. It may be worse after eating and somewhat relieved (if not too severe) by belching. It is likely to come on without effort and be unrelieved by rest, by nitrites, and by small or moderate doses of morphin. Especially in the cases with pain under the lower sternum or in the epigastrium, belching is frequent, and nausea and vomiting not uncommon. These symptoms, with pain, fever, and leukocytosis, create at times a very perplexing diagnostic problem; and it is here especially that a careful scrutiny of the heart by all methods including the electrocardiograph is most important.

THE SURGERY OF TUMORS OF THE BLADDER*

By FRANK HINMAN, M. D.
San Francisco

DISCUSSION by Benjamin H. Hager, M. D., Los Angeles; James F. Percy, M. D., Los Angeles; R. L. Rigdon, M. D., San Francisco.

BEFORE 1910, when Edwin Beer introduced fulguration, the only treatment available for a bladder tumor was surgical, and the results were poor and discouraging for both malignant and benign growths. There have been no epochal advances of surgical technique since then. Nevertheless we are able today to accept the responsibility of treatment of such a case with a certain sense of confidence which, however, is far from complete. The newest agent, radiation, is bolstered high above its ability by a hopeful enthusiasm, and we seem now to have reached a dead level of advance in the cure of vesical malignancy.

TREATMENT METHODS

Perhaps the next rise will follow improvement of surgical method, but discussion of this is pos-

* Read before the Urological Section of the San Francisco County Medical Society, January 29, 1929.

sible only in relation to the two epochal advances that give us our present advantage in the treatment of tumor of the bladder. Otherwise we might become surgical enthusiasts, revert to the hopeless state before 1910, and attempt to treat all tumors surgically. This would be even worse, in view of our definite advances, than to follow the advice of some of our radium optimists and eschew all surgery. The surgery of tumors of the bladder, therefore, must be presented in relation to these other two well-recognized methods of treatment, fulguration and radiation. One must know what can be accomplished with each one of these three methods and which one of them to apply in a given case. Urologists disagree radically about both points. One small group claim wonders for radium, the majority are doubters. Another small number extol fulguration and deep diathermy, methods which are often scoffed at by the radiologists. A third group cling to the idea that where fulguration fails, surgery is the hope of the future. Yet out of all this confusion some order may be gotten. The writer will consider the subject on the basis of his own personal experience; and will then take up the viewpoints of others.

PRIMARY CONSIDERATION

In the first place some uniform method of choice of treatment is required. The same plan cannot be applied to all types and conditions of tumors. The pathologic differentiation into epithelial, mesothelial, and embryonal groups of various types has no clinical value. We now know that the processes of change of both benign and malignant tumors of the bladder are fundamentally the same. All bladder tumors are potentially malignant, but there is considerable difference in

the degree of malignancy; for example, of a simple papilloma, a papillary carcinoma and a squamous cell infiltration. Broders has received some clinical support of his histologic classification of tumors into four grades on the basis of degree of malignancy as determined by the character of cellular changes and mitotic activity. Grades I and II being relatively benign, and Grades III and IV, highly malignant. In practice the value of this classification depends on the correctness of the assumption that all cells of any one tumor will show the same grade of malignancy. Examination of a specimen removed from an outlying polyp would have to give the same information as from any other portion, even from the infiltrating base, if these cells ran true to type. But there must be so many exceptions to this rule as to largely nullify its value. Another objection to placing entire confidence in such a classification is the fact that many times even the very benign Grade I tumors have been found to infiltrate the bladder wall extensively, a characteristic recognized clinically as indisputable evidence of marked malignancy.

CYSTOSCOPIC FINDINGS AS A GUIDE TO SURGERY

The only reliable guide to choice of treatment, the only one of immediate and practical value, is information obtained by cystoscopic study. A knowledge of the type, position, size, extent and number of tumors in a bladder, irrespective of the exact pathology, is a safe foundation on which to outline a plan of treatment. Not always can all of these facts be determined at the first cystoscopy. Bleeding may obscure the picture. Smaller tumors may be hidden behind larger tumors which are in the foreground. The plan of treatment may

DIAGRAM 1.—*Cystoscopic Classification of Bladder Tumors*

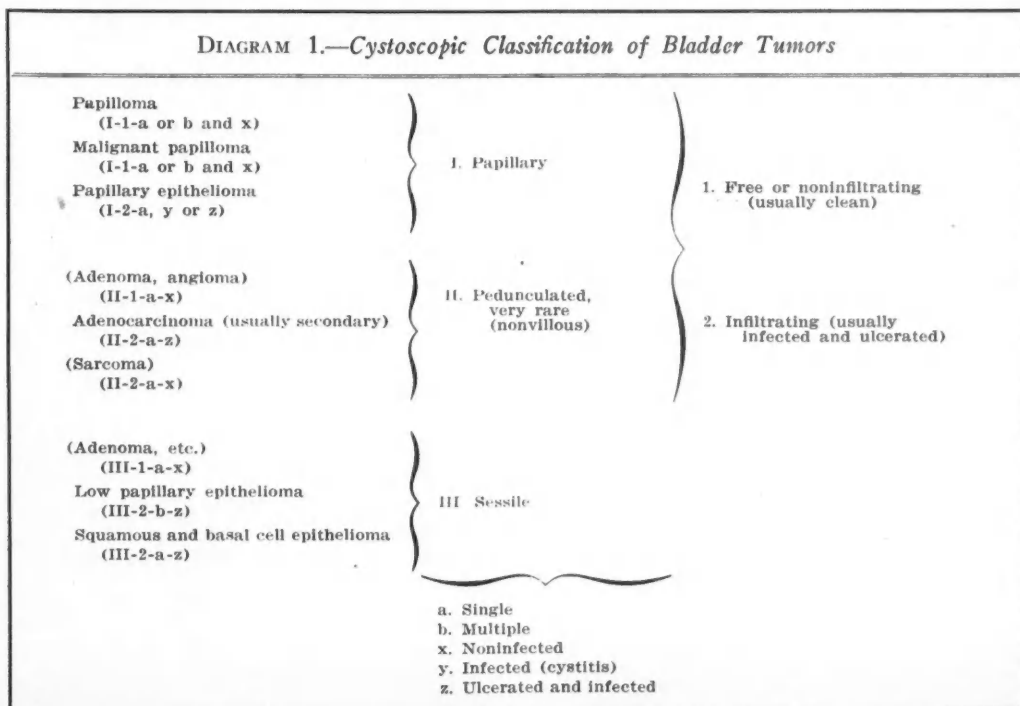


TABLE 1.—Cystoscopic Analysis of 172 Personal Cases of Bladder Tumors

		Single	Multiple	Clean	Infected	Ulcerated	Total
Group I.							
Papillary tumors:	1. Free	17	50	37	29	0	67
	2. Infiltrating	37	13	1	19	30	50
							117
Group II.							
Pedunculated:	1. Free	(2)			(1)	(1)	(2)
	2. Infiltrating	(10)	(secondary)				
Group III.							
Sessile:	1. Free						
	2. Infiltrating	17	(6 secondary)		14	5	11
							130
Cases not grouped because of incomplete descriptions							26
Group IV.		Prostate	Sigmoid	Ileum	Rectum	Vagina	
Secondary tumors:		6	4	1	4	1	16
							172
Summary: Primary bladder tumors 130							
I. Papillary				117			
II. Pedunculated				12 (10 secondary)			
III. Sessile				17 (6 secondary)			
				146 (16 secondary)			

have to be tentative and a change of attack clearly be contemplated should the result of the initial treatment prove disappointing. But the cystoscopic picture in conjunction with other clinical facts, such as the history and physical findings, particularly those of rectal or vaginal palpation, renal function and x-ray exploration, is the first guide of treatment.

Cystoscopically two types of tumor usually are quite easy of recognition, the papillary tumor and the flat, smooth-surfaced, infiltrating tumor. Between these two extremes there are all sorts of gradations, many of which are difficult of interpretation, but for practical purposes the following rather diagrammatic classification will serve as a guide to initial treatment. It is based on this objective distinction, that a bladder tumor may be papillary and villous, may project intravesically but with a nonvillous, smooth surface, a very rare tumor, or be so flat and broad that its surface is almost on a level with the bladder wall.

These types may be called papillary I, pedunculated II, and sessile III. Any one may be free on its pedicle and noninfiltrating, may have an ulcerated surface, or show infiltration of the neighboring bladder wall. The association of ulceration or infiltration is a reliable indication of malignancy. They may be single or multiple and with or without cystitis. The free, clean, villous growth is almost certainly a papilloma, the infiltrating flat tumor a malignant epithelioma, and a careful study of the associated conditions, as outlined in Diagram 1, will enable fairly accurate inference of the intermediate groups.

COMMENT ON TABLE I

The above analysis (Table 1), dealing with a cystoscopic analysis of 172 cases of bladder tumors, is an attempt to group the writer's own

cases according to the scheme of cystoscopic classification in Diagram 1. But it is open to criticism because the method has actually been in use by him only recently, earlier cases having been grouped by the description entered in their hospital or office records, which are often incomplete. Therefore subsequent pathologic findings cannot be taken as any criterion of the accuracy of cystoscopic observations and interpretations or of the value of the above scheme. However, it well illustrates the basis of choice of treatment which has been uniform in our clinic for many years, and will be of interest in connection with the results obtained by the treatment chosen on this basis.

Of 117 cases of papillary tumors there were sixty-seven cases in whom the tumors had a free pedicle; a single papilloma in seventeen cases; multiple papillomata in fifty; and fifty cases in which infiltration of the bladder wall was diagnosed. Thirty-seven of these infiltrating tumors apparently were single tumors, but this no doubt is a frequent error, inasmuch as the majority of these tumors were so large as to cover a considerable area and, although giving the impression cystoscopically of one solid mass, were often no doubt multiple and confluent.

If tumors of the bladder that are secondary to an extension from a neighboring malignancy, as of the bowel, prostate, or vagina, are excluded, only two of the 172 cases showed pedunculated growths and in neither of these was there a pathologic report. One of them recurred as a papilloma, so that it is most likely that the observation of an original pedunculated tumor is at fault; and the other responded to fulguration, which would tend to disprove its having been a true pedunculated tumor. Secondary growths are commonly adenocarcinoma, a very exceptional primary tu-

TABLE 2.—Treatment Used in 172 Bladder Tumors

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TYPE OF TUMOR CYSTOSCOPICALLY	NOT TREAT- ED	FULGURATION						RESECTION						CYSTOTOMY						CYSTECTOMY						Total
		Alone		With Radium		Free	REIMPLANT				Both		With Radium		With Diathermy		Both	FIRST STAGE			SECOND STAGE					
							Neph- rostomy		Ureters To:																	
							L	D	L	D								Right	Left	L			D	L	D	
I. Papillary																										
1. Free: Benign & Malignant				61	2	4																		67		
2. Infiltrating		1		9	4	4	6	2	6						1	3	2	4		#1 #3	#2		#1 #4 #5	#2	48	
Recurrent									2															2		
II. Pedunculated																										
1. Primary				1				1																2		
2. Secondary		6			1		2						1											10		
III. Sessile		1						1	1		2	1		1		2			1			#6		#6	11	
Secondary		2					1								2								#7		6	
IV. Not Stated		2	3	11		5	1							1							#8			#8	24	
Recurrent		1							1																2	
TOTAL		3	13	82	7	13	10	4	10		2	1		2	2	4	1	3	2	5	8 cases all dead					
		16		112				19				17				8								172		

L—Living.
D—Dead.

mor of the bladder, and vesical adenocarcinoma are commonly pedunculated in form. The great rarity of primary pedunculated growths, as shown by this and other analyses, other than adenocarcinoma, makes the finding of a true pedunculated tumor very suggestive of its being secondary to some adenocarcinoma of a neighboring organ, but it must be remembered that such a secondary invasion may appear as a flat ulcer (six cases).

There were seventeen typically flat sessile and infiltrating growths, all infected and the majority ulcerated. These were squamous or basal cell epitheliomata or secondary adenocarcinomata.

Twenty-six cases of bladder tumor are not grouped in the above classification because of the incompleteness of the cystoscopic records. Most of them, however, are analyzed later with respect to treatment.

PLAN OF TREATMENT

Cystoscopic findings outline treatment on the following plan:

Fulguration Group.—All papillary villous growths are subjected to fulguration. One thorough treatment usually demonstrates the probabilities of success by this method. As a rule during fulguration partially coagulated portions of the papillary mass come away on the fulguration tip and are satisfactory specimens for histologic study. But the clinical result of this initial treatment is of far more value than the pathologic report. Case after case of malignant papilloma and papillary carcinoma have been cured by fulguration alone. This fact should be emphasized. No credit can attach to the relief of such a case by radiation or surgery either alone or in combination. To the writer's mind there is no reason to subject these tumors to open cystotomy because

they are large or multiple. Furthermore the cystoscopic approach has the advantage of repetition as often as desired. Persistent repeated endovesical fulguration will often accomplish more than massive transvesical fulguration or diathermy. So satisfactory are the results of fulguration for the majority of vesical tumors that few would hesitate to choose it could they have but one of the three methods (fulguration, radiation, surgery) at their disposal.

Radiation and Surgery Group.—If initial fulguration of a papillary villous tumor fails to produce a definite and marked change, then persistence in its use will probably fail of effecting a cure. Such failures occur with marked infiltrating growths. The plan of attack now lies between radiation and surgery. If the tumor is resectable, surgery is preferable even though a ureter must be transplanted. If the tumor is so large or so situated that successful resection seems unlikely, radiation or transvesical diathermy can be elected. No uniform plan of radiation or transvesical diathermy can be outlined. There is too much difference of opinion of their respective merits. Tumors differ markedly in their degree of response. Many highly malignant tumors are radio-sensitive; less malignant ones often radio-resistant. Knowing a tumor to be radio-resistant, surgery would be the only hope.

If the tumor is of the low infiltrating papillary type with crater ulcer or is flat and sessile (Type III), initial fulguration is useless, and radiation or surgery must be used.

COMMENT ON TABLE 2

A brief review of the writer's own cases will illustrate this plan of treatment, as outlined in

Table 2, covering treatment used in 172 bladder tumors.

Fulguration alone was used in sixty-three non-infiltrating tumors, fulguration and radium in four; with satisfactory results in all but one. In that patient, vesical perforation occurred with extraperitoneal extravasation, relieved by immediate suprapubic drainage, but death occurred two weeks later from embolism. Fulguration alone was used in thirteen patients for infiltrating papillary carcinoma; fulguration and radium in ten patients. Four of the former and six of the latter are dead. Fulguration alone was used in eleven of the twenty-six cases in which the cystoscopic record is incomplete.

Radium alone was used on six patients for infiltrating papillomata, all of whom are dead, and in one patient with squamous cell epithelioma who is dead. Also in five patients in whom the type of tumor is not stated, who are all living.

Surgical treatment has been used in this series of 172 cases in forty-four; partial cystectomy or resection in nineteen; cystotomy with radium implantation or diathermy in seventeen; the first stage of ureteral transplantation preparatory for cystectomy in six cases; total cystectomy in two cases. All eight of these cystectomy patients have died.

Resections were performed in eleven of the patients with infiltrating papilloma. Nine are known to be dead, the longest period of survival being five years. Two were alive at last note; one two years, and the other six months, respectively. In ten infiltrating papillary tumor patients cystotomy was performed, and radium seeds implanted after diathermy six times, and diathermy alone was applied in four. Of the latter patients three are dead and one living now about one year; of the former, four are dead, one living almost two years, the others dying within the year; two were alive at last note but less than one year. In five, patients with extensive involvement, the first stage of radical cystectomy was attempted; all are dead.

Of the eleven patients having flat sessile tumors, two patients were treated by cystotomy with radium, one with diathermy, seven by radical surgery, and one patient was not treated. The first lived four and one-half months, the second one month, and the untreated patient two weeks. Of the seven surgical patients, four had resection (with reimplantation of the right ureter in two, of the left ureter in one, and of both ureters in one). In two patients the ureters were not transplanted, and in one a total cystectomy with abdominal drainage was performed. Duration of life in the five patients known to be dead was respectively, nine years in one, (who was cystoscoped about six months before death and seen to have a recurrence into which radium was implanted unsuccessfully), and two years, one year, and six months in two. Two patients died post-operatively on the first and second day and two patients were living when last heard from, two months and two years after operation.

THE TECHNIQUE OF BLADDER SURGERY

There are three objectives of surgery of tumors of the bladder: first, operation for the complete

removal of the tumor either by resection of the involved portion of the bladder wall with a wide margin of healthy bladder, or by radical cystectomy with ureteral transplantation; second, operation for the open treatment of tumors either with direct radium implantation or by massive diathermy; and third, operation for relief of the urinary obstruction and other abnormalities. The first method is radical; the second, therapeutic; and the third, a palliative type of surgery. For purposes of discussion the three may be outlined as follows:

TABLE 3.—Surgical Treatment of Tumors of the Bladder
Personal Cases

I. Operation for Removal of Tumor:	
1. Resection	
a. Without ureterocystostomy.....	14
b. With ureterocystostomy.....	5
2. Cystectomy with:	
a. Suprapubic ureteroneostomy.....	2
or In two stages, the first stage being:	
b. Lumbar nephrostomy.....	
or c. Ureterorectoneostomy (or both).....	5
The second stage, the removal of the entire bladder, vesicles, and prostate.	
II. Operation for Treatment of Tumor:	
1. Cystotomy:	
a. With diathermy and fulguration.....	11
b. With radium implantation.....	6
c. With snare removal or curettage and a. b.	
III. Operation for Relief of Urinary Obstruction:	
1. Cystotomy drainage.....	
2. Nephrostomy drainage.....	1
3. Ureterorectoneostomy.....	
	44

COMMENT ON DIFFERENT METHODS

It would hardly be indicated to give in detail each of the surgical steps of these procedures, but the writer would like to emphasize three steps which a review of his own experience leads him to believe as of the utmost importance in relation to operative mortality. The high mortality that follows surgery of bladder tumors is not due altogether to the condition it fails to alleviate. The present review of the writer's own cases convinces him that inherent defects of the surgery itself are somewhat responsible. One opens the bladder and removes a benign prostate with an operative mortality of around five per cent. Barringer opened the bladder for simple radiation with a mortality of three per cent; but Edwin Beer reports a 33 per cent operative mortality after radium implantation through simple suprapubic cystotomy, and a 21 per cent mortality after radical resection. Just what is the operative mortality of bladder tumor surgery is very difficult to estimate, and it is unfair to compare figures too closely. Everybody analyzes his own cases differently, and no two individuals will use a uniform classification. The trauma, spread of infection, locally with dependent pockets of poor drainage, and upward to the kidneys because of ureteral obstruction, as well as prolongation of operation in cases of resection, as compared to simple cystotomy for radiation or diathermy, make of the objective of removal a much graver surgical procedure than that of open treatment or of urinary drainage. But in this connection it must be understood that many cystotomies are not simple cystotomies because in the beginning the bladder was opened for resection and more or less extensively immobilized before the inoperability of the tumor was discovered. Diathermy or radium were then

applied as a substitute. The surgical trauma and difficulties of proper drainage are just as great or greater in this type of cystotomy as in resection and, therefore, so is the risk. Neff has emphasized this point by advocating delay in opening the bladder after suprapubic exposure so as to minimize spread of infection, and the low operative mortality reported by Barringer and Keyes must be compared to higher reports in the light of their cases being, as a rule, much better surgical risks since they elect open radiation for the majority of bladder tumors irrespective of type.

UNFAVORABLE FACTORS IN BLADDER SURGERY

As a leading factor against recovery in any bladder surgery is the frequency of ureteral abnormality either before operation—the most frequent position of vesical neoplasms being in the region of the ureteral orifices—or after operation, a majority of resections having necessitated reimplantation of one or both ureters. Pyelonephritis is often the silent burden that brings defeat. Preliminary nephrostomy offers little in the way of prevention in these advanced cases of cancer, as it means further surgery on patients already so debilitated as to be almost prohibitive surgical risks. And yet if we are to continue surgical attacks upon vesical cancer, this factor of ureteral obstructive and back-pressure pyelonephritis, as a complication either of the condition or of the surgery, must be recognized and combated. Of our own nineteen patients for resection in bladder cancer, one died of embolism on the fifth day, one of pneumonia on the ninth, and one on the forty-fifth of general sepsis, an operative mortality of 15.8 per cent. Of the seventeen cystotomy patients, four died in the hospital (on the sixth, eleventh, twenty-sixth and thirty-fifth days), a surgical mortality of 23.5 per cent. Of the eight first and second-stage cystectomies, six cent. In only two of these last patients was the patients died in the hospital, a mortality of 75 per bladder removed, one patient living six months. The other six patients had advanced bladder cancers with obstructed ureters in whom surgery was advised as palliation more than cure. A majority of the above postoperative deaths were autopsied, and the striking findings in practically all were pyoureters, pyonephrosis, or pyelonephritis.

Face to face with the above discouragement, only two paths are open, either to admit that surgery is useless and rely altogether upon fulguration and radiation or, still believing in it, to revise and perfect our present methods. It is fair to take this much consolation—that all the above forty-four surgical cases were extensive or advanced infiltrating type tumors, the majority in individuals over fifty-five years of age, and that the two longest survivals of the extensive infiltrating tumors were after resections; one patient living five years and another nine years. There are a few patients living, but not heard from. Furthermore, radium in our hands was not of any material help or benefit in these deeply infiltrating tumors. No patient survived its use longer than one year. The writer has no faith in radium for this type of case. Nor do the statis-

tics of others give him any hope; but, in spite of a row of surgical failures, he believes that where fulguration fails and the tumor is at all resectable, it should be resected. If not resectable, cystectomy is in order if at all feasible. If cystectomy is out of the question, the simplest thing that will make the patient the most comfortable should be done (palliation). The writer believes that we are a long way from a perfect technique for radical bladder surgery, just as we are in the case of the malignant prostate. The difficulty in each is ureter transplantation. Coffey's recent contributions to the technique of uretero-intestinal transplantation are very encouraging in this connection. A safe diversion into the bowel with control of urinary sepsis would certainly open up possibilities of radical removal of the whole lower tract, bladder, prostate, vesicles, and all. Not to be misunderstood, it should be stated here that the above group of infiltrating tumors that have been subjected to operation are the radio-resistant type of tumor. Some papillary infiltrating tumors are highly radio sensitive, and whether or not they should be treated by radium endovesically or by open cystotomy with radium implantation or, when accessible, by radical resection, are questions to be settled open-mindedly. Broder's classification gives promise of value, since most tumors graded III and IV have been found by Barringer to be radiosensitive, but the microscopic grading of tumors is unreliable, so that the only safe guide, after all, is the cystoscope. When to use x-ray is another problem. A working plan of treatment that conforms to our present knowledge of results, and that will act as a guide as to when to operate, is outlined in Diagram No. 2.

DIAGRAM 2.—Plan of Treatment

- I. Papillary Tumors:
 - First—Fulguration.
 - *Second—Pathology.
 - Third—Surgery for tumors graded I and II. Radiation for those graded III and IV.
 - *Fourth—Surgery.
- II. Pedunculated Tumors:
 - First—Pathology.
 - Second—If benign, nothing or surgery. If sarcoma, radiation or surgery when possible. If adenocarcinoma (secondary), radiation or palliation.
- III. Sessile Tumors:
 - First—Pathology.
 - Second—If epithelioma, surgery or palliation. If adenocarcinoma (secondary), radiation or palliation.

(*If ineffectual.)

COMMENTS ON SURGICAL TECHNIQUE

Should operation be selected as the method of treatment, preparation on the same principles and for the same reasons as before prostatectomy should be carried out. Initial nephrostomy or cystotomy may be required in order to restore renal function. If the patient fails to survive these therapeutic procedures, he most certainly would have died of the more extensive operation of which they are in preparation. At the time of operation the two factors that influence, more than anything, its ultimate success or failure are patency of the ureters and pelvic drainage. Autopsies of patients dying after extensive bladder operations show a preponderance of renal infections and of retention abscesses in the pelvis. It

is a safe policy to place in all reimplanted ureters large retention catheters that lead out suprapubically so as to maintain ureteral patency during the early days of convalescence as well as enable antiseptic lavage of the renal pelvis. For the same reasons retention ureteral catheters are indicated after extensive radiation or diathermy, whether endo- or transvesically, of tumors located in the region of the ureteral orifices. A combined suprapubic and perineal attack will secure better and dependent drainage as well as through-and-through irrigation for all extensive resections as well as cystectomies. Preliminary to suprapubic incision the patient is placed in the lithotomy position, the legs being held by assistants or nurses, and through a lateral perineal incision the space alongside the rectum and prostate (or vagina in the female) between levator ani and transversus perinei is opened up by blunt finger dissection and a good-sized tube or urethral catheter is inserted and secured here. Later extraperitoneal freeing of the base of the bladder exposes the inner end of this tube which may be used for drainage or the end of another tied to it for retrograde placement.

SUMMARY

It is fair to expect that attention to these three factors, (1) preparation of the patient; (2) ureteral patency and renal infection; and (3) dependent perineal drainage will reduce the present operative risk of resection from 15 or 20 per cent to 5 per cent. The conclusions to be drawn by this review of cases and operative experience may, therefore, be summarized as follows:

1. Bladder tumors may be classified cystoscopically as papillary, pedunculated or sessile tumors.

2. All papillary tumors should have initial fulguration. Fortunately the majority of papillary tumors seen early disappear under fulguration. If ineffectual, the pathology of the tumor will determine the next step. Highly malignant papillary tumors (graded III or IV) not destroyed by fulguration should have radiation and, if ineffectual, radical surgery. Less malignant growths (graded I and II) not destroyed by fulguration should have surgery. It is an open question whether all tumors that fail to disappear under fulguration, irrespective of pathology, located in an accessible position, should not be immediately resected.

3. Pedunculated tumors are rare and are either benign or are sarcomata or secondary adenocarcinomata. Knowledge of the pathology determines the line of treatment.

4. Sessile tumors are always malignant and almost always radio-resistant. Surgery is indicated except in those adenocarcinomata secondary to growths of neighboring organs.

5. All patients to be operated should have preparation on the same principles that are recognized as essential in the preparation of patients for prostatectomy. Nephrostomy or retained ureteral catheter may be required.

6. Ureteral retention catheters should be used during convalescence whenever indicated.

7. Combined suprapubic and perineal drainage is indicated in all extensive bladder surgery.

384 Post Street.

DISCUSSION

BENJAMIN H. HAGER, M. D. (1136 West Sixth Street, Los Angeles).—Doctor Hinman's analysis of the treatment of bladder neoplasms is in reality an enviable record. It is so thorough that I can but emphasize a few of the principles which have a bearing on cure and life expectancy.

It is regrettable that there is to date no universal nomenclature that suffices to catalogue with any degree of uniformity the gross and microscopic interpretation of kinds and degrees of malignancy. However, the American Urological Association is now engaged in obtaining complete histories and clinical findings, together with microscopic sections of all bladder tumors, in an effort to establish a more accurate and uniform description and to evaluate the end-results of the various forms of treatment. It behooves all those interested in the subject to aid this cause by complying with the requests made by the committee.

We support the belief that all bladder neoplasms should be regarded as malignant. The malignant aspects may not be conspicuous, but metastases have been observed as arising from primary bladder growths, which growths, in terms of textbook description, would come under the category of benign papillomata. It seems obvious, therefore, that some plan of cellular differentiation should be adopted, as clinical experience bears out the contention that tumors differ materially in their degree of malignancy, as demonstrated by their manner of growth and reaction to therapeutic measures.

I should like to emphasize the importance of biopsy at the time of cystoscopy. Most bladder neoplasms are easy of recognition. However, it is not infrequent that ulcers, granulomas, and particularly the infiltrating carcinomas, are extremely protean in their appearance, and diagnosis is made only by biopsy. Our experience does not sustain the view that removal of tissue for diagnosis predisposes to metastasis. Frater's elaborate studies have enhanced the value of biopsy. He has demonstrated that epitheliomas of the bladder do not show variation in grade of malignancy in different parts of the tumor. He also observed that with few exceptions malignancy does not increase with recurrence.

It follows, therefore, that, in general terms, the degree of malignancy is more often the criterion of the amenability to treatment than the site and extent of the tumor. As a matter of interest the more malignant lesions have a predilection for the most inaccessible areas from the standpoint of treatment. This is illustrated by the high-grade squamous cell epitheliomas, which occur most frequently in the base or trigone or surrounding the internal sphincter. The review of a large series of bladder neoplasms would indicate that about 95 per cent are epitheliomas. The majority of these are papillomas. It is obvious, therefore, that the great majority of bladder neoplasms are suitable for transurethral electrocoagulation, if they were recognized in the early stages of the disease. Papillomas are like warts; they tend to recur and appear usually, not at the site of the original tumor, but scattered over the bladder mucosa. The high-grade squamous cell epitheliomas and adenocarcinomas tend to recur at the site of the original growth. A cystoscopic examination at intervals, following the destruction of the bladder tumors, is imperative to insure against extensive recurrence.

What was said of the lack of uniformity of pathologic description applies equally well to the treatment. Our present-day armamentarium is limited to transurethral electrocoagulation, suprapubic electrocoagulation or surgical diathermy, segmental resection, actual cautery and radium. When the lesion is small and of low-grade malignancy, transurethral electrocoagulation is the treatment of choice. It is remarkable how extensive an epithelioma may be and still

yield to repeated transurethral electrocoagulation. When the lesion is extensive though of low-grade malignancy, suprapubic exposure with the application of actual cautery or surgical diathermy is advisable. Highly malignant tumors, regardless of extent or location, which permit of resection should be so treated. Surgical diathermy has been the treatment of choice in dealing with highly malignant tumors involving the base, trigone and external sphincter. Radium is probably best used as a palliative measure when extensive resection or surgical diathermy is contraindicated. While the use of radium has not been entirely satisfactory, some remarkable results have followed its use. It should not be used in preference to electrocoagulation or resection when they are feasible. Deep x-ray treatment should not be substituted for any of the previously mentioned methods of treatment, as the value of x-ray treatment in bladder malignancy is very doubtful. It is obvious that before any radical treatment is instituted metastasis should, in so far as possible, be excluded by a thorough physical examination and x-ray examinations of the chest, vertebrae, and pelvic bones.

Hinman's results are similar to those obtained by authorities throughout the world, and his experience again emphasizes the importance of recognizing early those symptoms which presuppose bladder malignancy. Better an unnecessary cystoscopic examination by a competent urologist than to wait for the layman's diagnosis. The good results of the future probably will not be so much dependent upon the perfection of present-day therapeutic principles or the innovation of new procedures as in the early recognition of the disease.

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JAMES F. PERCY, M. D. (1030 South Alvarado Street, Los Angeles).—The more I see of present-day discussions of the treatment of cancer in general the more I am amazed that a surgeon of Doctor Hinman's standing in urology would or could write a paper on malignancy of the bladder without once mentioning in its treatment the most important and reliable of all methods so far devised, viz., the heat-carrying cautery. He suggests that we attempt to draw distinctions between radio-sensitive and radio-resistant malignant bladder tumors, forgetting or ignoring that when either of these horns of his dilemma is finally recognized, the patient's malignancy has increased, both in extent and virulence, to an untreatable degree. More than this, I repeat, when he finally decides that fulguration and radioactive agents have failed, his patient is no longer a fit subject for the "useless" surgery he so reluctantly recommends. It is a matter for serious consideration to inquire as to when those who ignore the heat treatment of cancer will learn that when they have applied the limit of tissue toleration of radium and x-ray they have shot their longest bow, and the patient, if his growth does not recede, as it usually does not, is fit for nothing further than medical palliation.

When the cautery is applied we do not have to talk about heat "resistant" malignancies. There is no such tissue, for all cancer cells die when heated to 113 degrees Fahrenheit (45 C.) for ten minutes. As much can be said in condemnation of the cold knife resection of the cancerous bladder. It always increases the risk of an easy and early dissemination of the disease, stimulating it into new virulence and, as well, leaving a surface on which it will grow again. None of these things can be claimed against any sufficient heat infiltration or cautery resection of the malignant bladder.

It is my misfortune to see some of these patients with recurrences in the bladder after they have been treated by fulguration, to say nothing of the other methods mentioned by Doctor Hinman. I see a much larger number of recurrences where these same methods have been employed to destroy surface malignancies. When they come I frequently ask myself: "If recurrences develop on the surface of the body, following the employment of fulguration where the problem is easily accessible—all out-of-doors, so to speak—how can one expect good results by the same

methods applied indirectly through a long magnifying tube into the depths of a dark cavity in a thin-walled more or less mobile membranous sac such as the bladder?" In all the history of surgery no method, where the technique cannot be applied by direct vision and tactile sense, has persisted in the favor of surgeons for very long.

That fulguration does cure some cases of bladder malignancies I have no doubt, for the reason that any treatment, no matter how bizarre, will cure cancer, *sometimes*. All of which merely emphasizes that we know nothing fundamental or worth while about this disease. That fulguration will cure a large number of bladder carcinomas than infiltration of heat from the cautery through the open bladder, is an unfortunate statement which I earnestly challenge.

One of the, to me, serious mistakes in Doctor Hinman's technique is covered by his statement that "persistent repeated endovesical fulguration will often accomplish more than massive transvesical fulguration or diathermy." This is when I see some of these patients with their malignancy stimulated into new virulence by "repeated" applications of the frail, weak, feeble, meager, insignificant (when compared with the nature of the problem attacked), and completely inadequate sparking needle that is the instrument of election in this method. The first operation is the only real chance the surgeon has to destroy a malignant growth, and he cannot do it successfully the greatest number of times when seeing but a part of his problem through a small instrument such as the cystoscope while working in a great cavity. Every subsequent attempt at destruction must carry with it a certain accumulating geometrical ratio of failure. Fulguration in the treatment of cancer of the bladder except, possibly, in the most minor growths, is equivalent to asking a surgeon to go after a hippopotamus with the bean shooter of his boyhood days. It is this inadequate attempt at thoroughness with insufficient measures that will account, at least in part, for many otherwise preventable failures in the treatment of cancer of the bladder.

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R. L. RIGDON, M. D. (909 Hyde Street, San Francisco).—The paper of Doctor Hinman is in line with the high type of work we have come to associate with his name. The doctor has done what so many of us fail to do, namely, carefully studied and recorded his observations and findings. It is only by methods such as these that real advances can be made in any of the problems that confront us.

In my experience there are but two classes of bladder tumor that need be considered in determining treatment: (1) the type that can be benefited by means of work done through the cystoscope, and (2) the type which cannot be so benefited. In examining a bladder cystoscopically, it is not wise to attempt a too definite classification; the tumor can or cannot be benefited by endovesical methods. If it is possible to cure by local methods, those should be employed regardless of the type.

Between these two extremes there is a shading group that may or may not respond to local treatment. My feeling is that any tumor that offers any hope of cure should be subjected to thorough fulguration. The result of this procedure will be very soon manifest, and very often complete cure or marked alleviation will be indicated. Repeated fulgurations, at intervals determined by cystoscopic examinations, will take care of these tumors in a most satisfactory manner. I am sure all of us have patients who consult us at intervals, on whom we have removed tumors by the electrocautery method and there has been no recurrence over a period of years.

There is another group in which recurrences are seen at longer or shorter intervals. By examining these patients at stated intervals, these recurring growths can be detected and treated very early and thus kept under control. There is practically no operative mortality. The patient is subjected to an inconvenience, it is true, but the relief afforded is so great that the inconvenience can be disregarded. Practically every tumor that is not obviously beyond

help should be given the benefit of fulguration; if this fails it is time to try other methods.

The second group of tumor is altogether a different matter. The line of treatment chosen must be individual. I think it is a mistake to paint too gloomy a picture of surgery, for every now and then the resection of a circumscribed growth, even though located at the base of the bladder, is successful in eradicating the tumor, at least for many years. If the tumor is circumscribed I am sure its removal by surgery should be undertaken. If transplantation of the ureter is required, this should be done. There is a certain degree of mortality attached to this operation, but when we remember that we are dealing with a deadly enemy we are justified in recommending to the patient an operation, in the face of all the risk involved.

Those tumors that are sessile, widespread and infiltrating, are practically hopeless of relief. In these patients I believe we can justify ourselves in attempting any form of treatment or no treatment. Radiation may be tried, and this I certainly recommend. Resection may be attempted or total cystectomy. The Percy cautery may be our salvation. We know in the beginning that we are dealing with a fatal malady and that the only chance, if any, for the patient is by operation.

At the present time, unless there are strong contraindications, I believe the Coffey method offers the best means of relief. This method of treatment is radical and difficult, especially in the hands of inexperienced operators, but Doctor Coffey has developed the technique to such a point that it may be hopefully undertaken. It is for the surgeon to perfect his technique or to call to his assistance someone who has comprehended the fundamental problems involved and has developed the necessary skill to perform it.

DISCIPLINE OF THE LICENSED PRACTITIONER*

By PERCY T. PHILLIPS, M. D.
Santa Cruz

DAVID HARUM, from the wisdom of his worldly contacts with the cussedness to which man is prone, credited our weaknesses to the fact "that we all have as much human nature as others, if not more." Medical boards are faced at times with the unpleasant problem of dealing with the sinful nature of those licensed practitioners who have offended against the ethics of our profession and the state laws governing the practice of medicine.

There are two considerations we must have in mind in dealing with such offenders. First, they must be restricted or eliminated as in the judgment of the board seems best, so that their further activities will not jeopardize the welfare and health of the commonwealth. Second, they must be punished to the extent which a deliberate offense would warrant.

All procedure in matters of discipline should be conducted in such a manner as to demonstrate to the profession that the primary object is to conserve the rights and health of the public and not to see how severely the individual be punished. We must endeavor to make the punishment a reasonable one and, if possible, one that will give the offender another opportunity if he profits by the discipline meted out to him. In this way medical boards earn the good will and confidence of their

fellow physicians over whom they are given temporary control by political appointment. The board, too, must conduct its activities in a way to convince the public that during times of sickness and trouble none shall presume to give advice and medical treatment except he be honorable and proficient.

CREATION AND POWERS OF BOARDS

Before proceeding with the consideration of those special problems in discipline confronting boards, I am going to recapitulate the principles as expounded in law, creating boards of medical examiners and conferring on them such powers as are considered necessary and advisable in the performance of their duties; namely, issuing the license that certifies to the qualifications of one who aspires to the treatment of the sick and afflicted and confers upon him the right to pursue his activities in his profession in the commonwealth in which he lives. Second, to discipline those licensed individuals who, by their conduct, are forgetting that a privilege with its attendant responsibility has been given them and are conducting their activities in such a manner as to be prejudicial to the health and well-being of the citizens of the state.

In this address I shall quote extensively from the "Cyclopedia of Law and Procedure" and give excerpts from citations therein contained without, in each instance, identifying the decision or opinion cited:

"License, in its general sense, means a right or permission granted by some competent authority to do what is unlawful at common law, or is made so by statute or ordinance, including the one authorizing or requiring the license. A privilege is the exercise of an occupation or business which requires a license from some proper authority, designated by some general law, and not free to all, or any, without such license. It follows that an occupation or privilege license is the permission granted to an individual by a competent authority to engage in and carry on the particular business or calling to which it refers."

Whether a license to practice medicine is a property right and is to be treated under the law as such is a question in law that as yet seems undecided. Courts have rendered divergent decisions. The legal definition of a property right is as follows:

"The right of property consists in the free use, enjoyment and disposition of all a person's acquisitions without any control or diminution save only by the law of the land; the right to acquire power and enjoy it in any way consistent with the equal rights of others and the just exactions and demands of the state."

We know that while a license to practice medicine is a revokable privilege it is the most valuable possession of a physician and should ever be appreciated and treated as such. It is based on two primary requirements; namely, scientific attainment and good moral character. No one may deprive himself or be deprived of his scientific attainment except through the wilful impairment of his mental faculties. He may deprive himself and be deprived of his moral character by perverting his knowledge to illegitimate uses and by violating in any manner the general laws promulgated for the conduct of an individual in society. The technical question of the property

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right involved in the license to practice medicine touches the average physician only as a defense after laws are infringed.

"It is well settled that under the police power inherent in the state, the legislature may enact reasonable regulations for the examination and registration of physicians and the practice of medicine and surgery, and such statutes violate neither the federal nor the state constitutions. The authority of the legislature does not end with declaring what qualifications he who enters the practice of that profession shall possess. As it has plenary power over the whole subject it alone must be the judge of what is expedient both as to the qualifications required and as to the method of ascertaining those qualifications. The only limit to the legislative power in prescribing conditions to the right to practice is that they shall be reasonable; and whether they are reasonable the courts must judge. If the regulations and conditions are adopted in good faith and operate equally upon all who desire to practice and who possess the required qualifications, and if they are appropriate to the end in view, to wit, the protection of the public and are attainable by reasonable study or application, then the fact that the conditions may be rigorous will not render the legislation invalid."

BOARD AUTHORITY QUASI-JUDICIAL

"The authority of a state medical board in granting or refusing licenses to applicants, or in passing on the reputability of colleges, is neither legislative nor judicial, but quasi-judicial, involving the exercise of judgment and discretion. The ascertainment and determination of qualifications to practice medicine by a board of experts appointed for that purpose is not the exercise of 'judicial power,' as that phrase is used in conferring judicial power upon specified courts, although the statute provides for an appeal therefrom. Therefore, a statute authorizing a state board to ascertain and determine the qualifications of applicants to practice medicine is not unconstitutional as conferring judicial power on the board. A state medical board has full authority to prescribe rules and regulations governing the issuance of certificates of medical practitioners. An existing board, however, has no power to review the action of a former board. The requirement that a medical board shall issue to the holder of a diploma a certificate entitling him to practice medicine is based almost universally upon the express condition that the diploma shall be from a reputable institution or an institution in good standing. Whether a college be reputable or in good standing is not a legal question but a question of fact and is usually left to the judgment and discretion of the state board unless the status of such schools and colleges is fixed by statute. Where the law does not define the method by which the board shall proceed to determine the reputability of a college such board may perform its duty in that regard in any reasonable way it may deem proper; and the decision of the board in this regard cannot be coerced or reversed by the courts in the absence of arbitrary and oppressive conduct on the part of the board. State medical laws sometimes contain a provision authorizing resort to the courts for relief either by way of appeal or by writ of review against the action of a board of examiners in refusing a license to an applicant or revoking the license already granted. The law usually provides the manner of taking this appeal, but failure to do so does not effect the right."

Pending an appeal from a refusal to grant a license or pending the hearing on writ of review when a license has been revoked the court has no power to allow the applicant to practice.

REVOCATION, SELF-EXECUTING JUDGMENT

The revocation of a license is a self-executing judgment and the judgment takes effect when pronounced and must so stand until after a full hearing on review when the court may uphold or

reverse it. Our experience has been that it is very difficult to get a justice or police court to function if there is an appeal pending in the case of one whose license is revoked and is subsequently arrested for practicing. There seems to be no question as to the legal status of a self-executing judgment. One of the duties of a board is to oppose energetically this attitude of the courts and prevent the abuse of a just provision of law. An appeal in some cases is delayed months or years before finally decided, during which time the respondent goes merrily on practicing medicine.

"The state, in the exercise of its police power, may prescribe the qualifications of persons desiring to practice medicine and may create a board whose duty it shall be to hear and determine any complaint made against any person holding a physician's license and certificate and revoke such license or certificate for any cause provided for in the statute. The power to revoke such license or certificate is not a judicial power, and cannot, under the state constitution, be vested in the board of examiners. Whether such a statute authorizes the revocation of a certificate issued prior to its passage depends entirely upon the wording of the statute. The fact that a license is issued to one not entitled to it will not prevent the board from revoking it.

The grounds commonly designated by the statute upon which the medical board is authorized to revoke a physician's license or certificate are unprofessional, dishonorable or immoral conduct. Unprofessional or dishonorable conduct is not defined by the common law and what conduct may be of either is a matter of opinion only. The word unprofessional has been judicially defined as synonymous with dishonorable. For this reason it has been held in several cases that such a statute is void for uncertainty. Similar statutes have been construed in other jurisdictions without the question of validity being raised, the courts merely considering what can be deemed unprofessional, dishonorable or immoral conduct.

The action of a medical board in revoking a physician's license or certificate for unprofessional or dishonorable conduct, being in its nature judicial, the board has no power to institute such a proceeding without a reasonable notice of the charge against him, and the time and place of the trial thereof. But a board, in conducting such an investigation, is not a judicial tribunal, and is not governed by the technical rules applicable to law courts.

The practice in revocation proceedings before a medical board being more flexible than that allowable in the courts, evidence which tends to prove or disprove the point at issue may be introduced, although not the best evidence which might be had."

Our experience has been that the more nearly we adhere to court procedure and rules of evidence as established in the courts the more satisfactory and more effective are our hearings. This is reasonable, for rules of evidence are based upon reason and sound judgment of those who are trained in the administration of law. We have adopted the following procedure at all legal hearings. The following resolution is passed:

"Resolved, That the president be and he is hereby authorized for and on behalf of and as an act of the board to make the necessary rulings in relation to the admission or rejection of testimony and motions made incident to any pleadings on trial in each case on the legal calendar at this meeting. It is the duty of the president to inform himself to the extent of being able to rule intelligently."

He will make mistakes, as judges do, but he is not likely to make many reversible errors. The

appellate and supreme courts have indicated their appreciation of our efforts to admit the best evidence and only the best evidence. With this procedure we find ourselves better able to render a just decision, one not liable to reversal.

"Where no appeal is provided for, in the absence of fraud, corruption or oppression, the findings of a medical board in a proceeding to revoke a physician's license are conclusive with the courts. But an appeal or writ of review in such case is sometimes provided for to the district or circuit court in and for the county in which the hearing was had; and the right is not nugatory, because the legislature has prescribed no rules of practice to guide the district court in adjudicating such cases."

A medical board is not precluded from preferring charges against a physician to revoke his license by the fact that the same charges had been once before passed upon by them and had not been sustained. Nor are the trial and acquittal of a physician in a court of criminal jurisdiction on the same charges exhibited against him by a prosecuting officer, a bar to an inquiry under the statute for the purpose of depriving him of the right to practice. In this connection there are several citations where it is held that the two proceedings are entirely distinct and independent, having different objects in view; the one having regard to the general welfare and criminal justice of the state; the other simply and exclusively to the respectability and character of the medical profession, and the consequences connected with or necessarily flowing from it.

HONOR AND GOOD MORAL CHARACTER

"The legislature has the same power to require, as a condition of the right to practice, that the applicant shall be possessed of the qualifications of honor and good moral character, as it has to require that he shall be learned in the profession. This places upon medical boards the obligation of determining standards of personal character and conduct as well as the standing of medical institutions whose diplomas are offered as proof of technical proficiency."

At present medical laws in the majority of the states only provide for revocation on those things involving character. There is discussion at the present time as to the advisability of universally including gross neglect and malpractice in the items demanding revocation. Before proceeding with such enactment all phases of this subject should be thoroughly considered because those of us with experience in board work recognize the dynamite contained in any suggestion of standardizing methods of treatment.

UNPROFESSIONAL CONDUCT

I shall only discuss those items of unprofessional conduct which are common to the medical practice acts of most of the states and these perhaps are the ones that occupy more of our attention.

First: The wilful betraying of a professional secret. This is so plain that it needs no discussion, but I am referring to it from the fact that it does involve the age-old principle in common law of privileged communication. Confidential relationship prevails in all professions and in none should it be more strictly adhered to than in ours.

Second: Conviction of any offense involving moral turpitude, in which case the record of such conviction shall be conclusive evidence.

Moral turpitude is a term not clearly defined. What constitutes moral turpitude or what shall be held such is not entirely clear. Everything contrary to justice, honesty, modesty or good morals is done with turpitude. The ordinary definition in law is:

"Anything done contrary to justice, honesty, principle, or good morals; an act of baseness, vileness or depravity in the private and social duties which a man owes to his fellowmen or to society in general, contrary to the accepted and customary rule of right and duty between man and man."

There are, of course, cases that admit of no discussion and are recognized by public opinion in general as well as all courts of law as involving moral turpitude. On the other hand, there are the border-line cases that are a matter of individual opinion among right-thinking and well-meaning people. Matters of individual standards of conscience perplex both the courts and defendants and perhaps confuse testimony and influence decisions.

I think we can be safely guided in our decisions by applying this accepted legal definition of morality:

"The rule which teaches us to live soberly and honestly; that science which teaches men their duty and the reason of it."

If all do their duty according to the mere established rules of conduct no one is harmed and society does not suffer. I think under this definition all will agree that any violation of the laws prohibiting the traffic in narcotics, either through carelessness or evil intent, is moral turpitude and should be punished as such. This should apply especially to the profession of medicine, for let us not forget that it is not by scientific attainment alone we have established and maintained our reputation. With science have ever been morality, integrity and service. A service ready to give battle not only for health but for that righteousness that exalteth a nation.

Third: Aiding and abetting an unlicensed practitioner. This question is prominently before the boards in some states in reference to the practice of nurses and laymen administering anesthetics. The law in a few states provides for lay anesthetists who have had special training in the work. In others, as in California, there is no such provision. Such opinions as are available admit that the administration of anesthetics is practicing medicine. There is at least one supreme court decision upholding a verdict for damages against a hospital where death occurred during the employment of a layman for such service. There, of course, is argument on both sides, but it is in the interests of the public and profession that the matter be definitely decided by discontinuing the practice. Creating special class privileges is not in any way advancing scientific medicine or protecting the public health.

Fourth: Advertising. "Mere advertising by a physician is not such unprofessional conduct as to warrant the revocation of his license. If, how-

ever, the advertisement is false and known to be false and is a studied effort to impose upon the credulity of the public for gain, the law is otherwise."

Advertising treatment or cure of venereal or sexual diseases is, perhaps, the most difficult division of the law in which to get a conviction. Of course, the venereal part is plain, but what constitutes a sexual disease? Which organs are sexual organs? Except the advertising matter is plain and without attempt at subterfuge, even though the board sees the intent, it is difficult to convince a court on a writ of review that the language is anything more than is ordinarily used in the professional cards of the urologists. There seems no way to write the law more plainly or more specifically. We must struggle along and endeavor to furnish such testimony to the fact and such expert testimony as to convince the court we are right in our judgment and discipline.

Fifth: Habitual intemperance. No duty confronting the board is so unpleasant as to discipline a professional brother who is guilty of intemperance. It is indeed a sad undertaking to expose the indiscretion of one who is his own worst enemy. We would prefer to cover his frailties with the mantle of charity but our duty to those who have placed their health in our hands often compels us to remove from the field of medical activities an unsafe and dangerous practitioner.

CALIFORNIA BOARD

During the last ten years the Board of Medical Examiners of California have issued 198 citations. Of these forty-seven citations have been dismissed. Eighty-five licenses have been revoked; eight have been suspended and fifty-one have been placed on probation. During this time we have restored four licenses unconditionally and nine with probationary limitations. The courts have restored seven licenses. We have thus been reversed but seven times on writs of review. Such statistics are local and uninteresting except that they indicate a definite policy on the part of the California board to apply discipline in its fairest and broadest sense. Not only does discipline imply correction and punishment but education, instruction, training and culture. We hold that medical boards, not only from the standpoint of their licensing function but also because of their duty to maintain discipline, should take a lively interest in all matters of medical training and education.

INSTRUCTION IN ETHICS

Certain pitfalls in the path of the physician come too frequently to the attention of the boards to be lightly classed as individual cases without general application. Boards should call these to the attention of those whose duty it is to prepare the graduate in every way for an honorable and upright career. More impressive instruction in ethics should be given in the colleges. Code laws appertaining to medical practice are based on the established ethics of the profession as well as upon common law. The student

should be thoroughly impressed with the fact that unless he has a desire and determination to pursue a true professional career his life will be without substance. It is kinder to separate an immoral candidate from his right to practice medicine before he earns a diploma than to leave it to a medical board to sidetrack a career when the time is past to choose another field less governed by moral standards.

MEDICAL BOARD SERVICE

Often when the zero hour comes during our work with the board we members ask ourselves the question: What does the board give us? The question should be what do we give the board? The board gives us an opportunity every man should grasp to assist in maintaining the moral and scientific standards of our profession. It is not a selfish employment. On the other hand neither is it a service that always brings from the public or our fellow physicians the praise that would be reward enough.

In the last analysis service on boards of medical examiners is perhaps our recognition of the fullest demand for service required by that oath we took when we enlisted in the healing art; "that it might be granted to us to enjoy life and the practice of the art, respected by all men in all time."

Farmers & Merchants Bank Building.

"TRAUMATIC HYDROCELE"*

WITH AN ANALYSIS OF THIRTY CASES

By MILEY B. WESSON, M. D.

San Francisco

DISCUSSION by Otto R. Frasch, M. D., San Francisco; George W. Hartman, M. D., San Francisco; F. S. Dillingham, M. D., Los Angeles.

INTRODUCTION

THE term "traumatic hydrocele" is as unscientific a misnomer as is "typhomalaria fever," and should likewise disappear from medical literature. Inflammation, with a resultant blocking of the lymphatics of the scrotum, is the cause of acute hydrocele, while low-grade infection, repeated slight traumas, or prolonged irritations may eventually result in a chronic hydrocele. However, when an enlarged scrotum is noticed, the insurance claimant eagerly remembers some slight injury to which he can attribute it, and generally a diagnosis of "traumatic" orchitis or hydrocele follows promptly.

Trauma and strains have become universal etiological factors for industrial lesions, and are comparable to some of the cultists' dislocated vertebrae and pinched nerves as the cause of all diseases, ranging from backache to hydrocele or hypertrophy of the prostate. The cultists overlook the fact that a vertebra cannot be dislocated, 1195 pounds of pressure crushing the neural arch and 800 pounds more pulverizing the body but leaving the articular surfaces unaffected, hence they have no difficulty in "making an adjustment,"

* Read before the Urological Section of the California Medical Association at its Fifty-Seventh Annual Session, April 30 to May 3, 1928.

precisely as some industrial surgeons are inclined to forget that no pathologist has yet been able to find any evidence of a connection between a strain and a hydrocele or tonsillitis.

Just as the etiological factors responsible for diseases began to be scientifically studied, political elements entered and the pendulum started to swing backward, with the result that trauma again came into its own with physiotherapy as its handmaid. Our scientific ideas of etiology have been subordinated to the questionable hypothesis of "*locus minoris resistentiae*," with the result that there is a tendency to use only one industrial rule, to wit: The man was well and working, he suffered a trivial strain; now he cannot work, therefore, his strain or trauma was responsible for his arthritis, paresis, tuberculous epididymitis, hydrocele, or what not. Unfortunately the scientific urologists, for obvious reasons, only occasionally see industrial cases although such often present fascinating problems; and when they do are surprised to find that their opinions are usually brushed aside in favor of those of orthodox members of the trauma cult.

This article was prepared because nowhere could be found a series of case reports from which any deductions could be made as to the importance of trauma as an etiological factor in hydrocele. This paper is based upon a study of the literature, and upon thirty case reports—twenty-four from my files and six from the California Industrial Accident Commission, the latter representing all that have been passed upon by their medical department.*

SOME NOT VERY OLD VIEWPOINTS CONCERNING DISEASES

Scientific medicine is so young that the majority of us have lived in the day when the doctor was primarily interested in the treatment of diseases and not in their etiology and pathology. Necessarily, some of our present-day theories as to the causes of disease are still based on faith, but although we have all been medically raised, directly or indirectly, on the teachings of Adami's Pathology and Pepper's System of Medicine, we no longer believe that epidemic cerebrospinal meningitis is due to mental or bodily strain, drinking alcohol, exposure to extremes of heat or cold, homesickness, or checking perspiration. Neither do we believe that tabes is due to the jolting of a railroad train, the undue repetition of the sexual act, particularly in an upright position, or the use of alcohol and tobacco. We know that acute spinal meningitis is not due to violent bodily effort, and that malaria is not caused by "swamp poison" caught in the pans of milk exposed to night air. Jacobi, while accepting the theory that infantile paralysis was due to trauma, the mother walking too fast and dragging the child by one arm, thereby wrenching and pulling it violently, still could not understand why, in the great majority of cases, the lesion was situated in the lumbar cord. We know that tetanus is not the result of

strain and as yet have not reaccepted traumatic cystitis as a recognized entity. Yellow fever was attributed to fomites and atmospheric impurities, and the *Stegomyia fasciatus* continued with its work while the city councils of the South financed "shotgun quarantines." Most of us remember the last big yellow fever epidemic in New Orleans when the United States mail was fumigated, the envelopes first being perforated so as to let out the miasmata. Twenty-six years ago yellow fever was endemic in Rio de Janeiro and ships from that port came in rock ballast to Brunswick, Georgia, for turpentine, etc. The United States Marine Hospital Service ordered Surgeon W. C. Hobdy to have the stones individually dipped into a tub of acidulated bichlorid of mercury solution before being carried ashore, and then the sides of the ship's hold had to be thoroughly washed with the same solution. Only a decade ago, no appendectomy report was considered complete unless the survivor remembered when he ate the blackberry jam or grapes; and many a woman with a cancer in the breast painted a vivid word picture of the time she was pinched or kicked by a nursing infant.

Naturally, today we are inclined to be amused by the recital of such etiology and therapy, but are we entitled to laugh? Although every medical student is taught that tabes and paresis are always the result of syphilis, last year the medical director of an eastern industrial accident commission decided that paresis is not necessarily caused by syphilis but might be the result of trauma. One of the universal, recognized, congenital anomalies is the undescended testicle and concomitant hernia, yet such has been legally found to be due to strain and not maldevelopment (Case 27).

ETIOLOGY

The relation of hydrocele, tuberculosis of the epididymis, and new growths of the testicle to injury is not clearly indicated although it is common to obtain a history of a blow on the testicles in these diseases. However, since every man has had his testicles more or less frequently traumatized there is danger of attributing to injury diseases of the testicles which were present before the injury was received and to which the accident merely called attention; the strain or blow being an eagerly remembered coincidence. R. G. Mills says: "As to the influence of indirect strains, I cannot conceive of any mechanism for the production of hydrocele even with the greatest stretch of imagination." W. G. MacCallum adds, "So much seems the result of tradition and more especially of the will to have it so, because it is an excuse for making the insurance people pay." The French school long since abandoned their theory of a spasmodic contraction of the cremaster muscle playing a part in the causation of hydrocele. Any inflammatory process which interferes with the lymphatic drainage of the tunica vaginalis may cause a hydrocele. Commonly an acute hydrocele is due indirectly to a seminal vesiculitis, and directly to an epididymitis. The course of an acute hydrocele corresponds to that of its

* The use of the medical records of the California Industrial Accident Commission is due to the courtesy of the medical director, Dr. Morton R. Gibbons.

cause. It tends to recover as the primary disease improves, and becomes chronic as the cause persists. It is possible for the exciting factor to entirely disappear, however, and leave behind it a persistent hydrocele.

Gonorrhea or tuberculosis of the epididymis are the two infections which most often produce symptomatic hydrocele. The former causes a very acute type, while the latter tends to a more chronic course. In the absence of any genital focus it is possible for a blood-borne infection to be responsible for the inflammatory blocking of the scrotal lymphatics. Chronic hydrocele is also caused directly by infections of the pneumococcus, colon bacillus, typhoid, spirochaeta pallida, and indirectly by erysipelas, rheumatism, and neoplastic growths. Injuries at birth have been held responsible for certain cases of congenital hydrocele, and repeated slight traumas undoubtedly result in a low-grade inflammation and infusion, as demonstrated by the frequency of chronic hydrocele among circus riders and bicycle riders. Chronic inflammation, with or without bacteria present, favors the production of serum; consequently, it is possible for fluid to accumulate as the result of trauma alone, exactly as it does in a knee that has been injured. However, due to a previous injury, conditions are produced that favor the collection of fluid very rapidly under subsequent trauma when the degree of injury may be much less than that required in the first instance.

Chronic irritation of the local circulation is the probable causative factor of the idiopathic cases of the tropics commonly attributed to loose clothing or sexual excesses, both of which tend to hyperemia and formation of serous exudate. Filariasis and bilharzia have frequently been indicted, but never convicted. Occasionally a transitory hydrocele may be due to the peritoneal vaginal process remaining open so that the cavity of the tunica vaginalis communicates with the abdominal cavity. Somewhat more frequently the obliteration of the process is not complete so that various portions of it persist, thereby forming types of hydrocele of the cord. Recent statistics have noted the occurrence of an unusually large number of hydroceles following the resecting of veins in varicoceles, or transplantation of the cord in herniotomies, due to the blocking of lymphatics.

Negative histories of venereal diseases are valueless. It was recognized as an axiom by doctors of past generations that most men would admit a history of syphilis but deny that of gonorrhea, whereas at the present time the workman is prone to deny both, particularly if he has had experience with the old-time "company doctor" who was reputed to attempt to attribute all injuries to venereal diseases, thereby converting them into private cases, such not being covered by his contract. Because of this workman's "viewpoint" a seminal vesicle examination should be routinely made in all cases. If infection is found and there is no history of gonorrhea, in order to complete the record, a careful sexual history should be taken, as admitted abnormalities may furnish a reason for the prostatitis. A nonvenereal prosta-

titis is much more resistant to treatment than one due to gonorrhea.

PATHOLOGY

Inflammation is the local reaction to injury, and it is not always the result of bacterial activity although such is the common cause of acute conditions. Hence, anything which causes local injury to the tissues is a cause of inflammation, be it a mechanical trauma, physical insult (by heat, cold, or electricity), disturbances of altered metabolism and abnormal internal secretion, or bacterial or microbic invasion and growth.

A contusion causes rupture of capillaries with a greater escape of blood into the parts. The fluid and parts of the corpuscles are drained away by the lymphatics, the mass of corpuscles, being out of place, degenerate, their hemoglobin dissolves out and undergoes a series of reactive processes characterized by the color changes of the "black eye." Eventually the leukocytes carry away the debris and the parts return to normal.

In ordinary trauma there is (1) pain, which is increased by motion; (2) loss of function with swelling beneath deep fascia; and (3) discoloration, which will appear probably at once because of injury to superficial structures. *Ocular evidence of trauma, such as ecchymosis, should always be present at the time of an injury that is alleged to result in a hydrocele*, and even then, at best, trauma is only the aggravation factor and not the cause of the hydrocele.

SYMPTOMATOLOGY

The symptoms of acute hydrocele depend upon the virulence of the infecting agent. Pain may be present or absent. In acute gonorrheal epididymitis the exudate is nature's attempt to protect the diseased part from outside injury. It is possible that the tension of the complicating hydrocele may be responsible for part of the severe pain, as occasionally marked relief follows the release of the pressure. The hydrocele accompanying tuberculous epididymitis, on the contrary, rarely causes any discomfort. The symptoms that cause the patients to seek relief are the pain of the epididymitis, or the cosmetic deformity of the tumor.

TREATMENT

The treatment is usually palliative if the causative infection runs a short and acute course, and the amount of fluid is small. With rest, elevation of the scrotum and hot moist dressings, the effusion may be left to absorb. Severe pain with considerable fluid demands aspiration, and this will probably have to be repeated as the effusion tends to reform quickly. If tapping is done, careful palpatory examination should be made at once to determine whether epididymitis or malignancy is responsible. When the fluid fails to be absorbed after some weeks, the hydrocele is considered chronic. In such cases where there is no pain, relief may eventually be sought because of the cosmetic deformity. Various drugs have been injected into the empty sac, the most common being tincture of iodine or phenol followed by an alcohol irrigation. Theoretically the epithelial lining of the sac is destroyed so that the walls will adhere

TABLE 1.—Analysis of Thirty Cases of "Traumatic Hydrocele"

No.	Case No.	Age	History of Venereal Disease	Alleged Etiology	Findings	Comment
1	121	55	0	Left hydrocele, strain, 6 yrs. ago.	Right spermatocele, left hydrocele, prostatitis and seminal vesiculitis.	Chronic left epididymitis. Aspiration: 7-8-26—450 cc. 1-26-27—300 cc. 12-27-27—350 cc. Injected 3cc. 5% "220," Cure
2	197	60	0	Blow in groin.	3 successive scrotal operations: Hydrocele of cord (?). Gumma and cellulitis (?). Sarcoma (?) and exitus on operating table.	All surgery and no diagnosis; a questionable industrial case. Death claim paid.
3	263	31	Gonorrhea 20	Swollen testicle following straining at stool 40 days ago.	Prostatitis and seminal vesiculitis. Left epididymitis and hydrocele.	
4	269	25	Gonorrhea 15	Strain from lifting, on following morning hydrocele appeared.	Prostatitis and seminal vesiculitis. Left epididymitis. Bilateral hydrocele.	Rejected.
5	283	50	0	Foot slipped seven days ago.	Prostatitis and seminal vesiculitis. Bilateral epididymitis and hydrocele.	Rejected.
6	302	68	0	Horseback riding, pain in right groin, 2 years ago, swelling began 7 months ago.	Right hydrocele.	Aspiration: 11-21-23—300 cc. 4-22-24—500 cc. 4-29-24—400 cc. Radical operation
7	396	47	0	Blow in groin.	Large left hydrocele; small right hydrocele (not known to patient). Prostatitis and seminal vesiculitis.	(Accepted) Radical operation 12-3-24
8	640	36	0	Blow on testicle 10 days ago. Similar swelling 1 year ago.	Left hydrocele. Prostatitis and seminal vesiculitis.	Left epididymitis found when 140cc. of hydrocele fluid withdrawn. After hospitalization 1 mo. right epididymitis followed walk of 1 block.
9	670	38	0	"Slipped on top of mountain and rolled to bottom"—hydrocele 3 weeks later.	Right hydrocele.	Aspiration—500 cc. Radical operation.
10	803	57	0	Industrial claims in 1907, 1918, 1923 and 1924. Struck scrotum, and hydrocele followed.	Left hydrocele. Prostatitis and seminal vesiculitis, left hernia.	Rejected.
11	847	30	Syphilis 17 Gonorrhea 19 22, 28	Three days previous lifted 100 lb. weight, turned suddenly, pain in right testicle.	Right hydrocele. Prostatitis and seminal vesiculitis, bilateral chronic epididymitis.	Double herniotomy at 22, followed by right epididymitis.
12	855	58	0	Blow on testicle 5 years ago, hydrocele followed. 10 x 6 cm.	Left hydrocele. Prostatitis and seminal vesiculitis. Stony hard nodule-carcinoma (?) in prostate.	
13	907	23	0	Dec. 13, 1926, lifted a weight and immediate pain in right groin, 3 days later scrotum size of an orange.	Right hydrocele. Prostatitis and seminal vesiculitis. Left hernia.	(Accepted) Radical operation; right hydrocele, small left hernia.
14	1079	36	Gonorrhea 17	1920 right herniotomy: 9-23-25 fell astride bar, hydrocele followed. 11-24-25 aspirated 6 oz. 3-12-27 aspirated 2 oz.	Prostatitis and seminal vesiculitis. Right testicle 10 x 6 cm. Right hernia.	11-4-27 Radical operation; right herniotomy and orchidectomy.
15	1107	63	0	Blow in right groin 4-4-27.	Right hydrocele (20 yrs. duration). Prostatitis and seminal vesiculitis. Tbc. left pubis with sinus in right hydrocele wound. Tbc. right epididymis with sinus.	5-10-27 Radical hydrocele (family physician). 3-14-28 Exitus, pulmonary tbc.

No.	Case No.	Age	History of Venereal Disease	Alleged Etiology	Findings	Comment
16	1240	47	0	Strain of lifting.	Right hydrocele. Prostatitis and seminal vesiculitis.	(Rejected) Radical operation 1-16-28
17	Dr. Kim-berlin's case	32	0	Walking up and down stairs and crawling into show windows; no trauma. Swelling on May 1926.		(Rejected) Radical operation 6-13-26. Thick sac. Epididymis negative (?)
18	329	29	Gonorrhea 26 Syphilis 20	Jolting from truck.	Epididymis negative. Prostatitis and seminal vesiculitis; bilateral hydrocele, small.	(Rejected)
19	719	26	Gonorrhea 20	Trauma of groin, 1 year previous.	Urine staphylococcus. L. globus major 2 in. in diameter; left vasitis.	(Rejected) 6-3-26 operation radical hydrocele. Family physician reported subcutaneous tissues of scrotum were congested; tunica vaginalis contained bloody fluid.
20	1002	22	0	1 mo. previous left foot broke through snow crust.	L. tbc. epididymitis. R. epididymitis. Urine, staphylococcus. Inguinal rings tight.	Case accepted as hernia, then large hydrocele appeared and was tapped. 6-18-27 left epididymectomy. (tbc.)
21	1008	54	Gonorrhea 30	"Foot slipped."	Bilateral hydrocele. Chr. prostatitis and seminal vesiculitis. Direct inguinal hernia; median bar.	
22	1036	48	0	Lifting.	Left hydrocele. Left epididymitis. Chr. prostatitis and seminal vesiculitis.	
23	1099	57	0	Trauma to right testicle 6 mos. previous. Hydrocele tapped 5 times.	Right testicle, 6x4"	8-31-27 Right orchidectomy; organized hematocele.
24	1186	46	Gonorrhea 20 23	Jumped 4½ feet to ground. 3 days later right epididymitis. 26 days later hydrocele—aspiration, 300 cc.	Right tbc. epididymitis. Prostatitis and seminal vesiculitis.	Right testicle swollen at age of 10. Past 4 yrs. confined to tbc. sanatorium.
25	*IAC 20031 5-28-26	54	0	Right herniotomy 8-20-22; recurrent right herniotomy Dec., 1922. Scrotal swelling began immediately, surgeon thought it due to buried catgut; then left hernia appeared.		Commission asked: Did the hydrocele have any relation to accident which caused recurrence of hernia? Ruled it did not, "as hydrocele is so common independently of hernia and is so rare following hernia." Awarded — Radical operation.
26	*IAC 1044 3-29-15	?	?	14 ft. ladder slipped from under him. Swelling of scrotum began on following day and after 3 hours it was 12x10". Several years before injured same testicle riding horseback. At time of fall had planned for operation on left varicocele — due to strain.		Commission ruled: "Take nothing."
27	*IAC	17	?	Lifted crate of eggs and felt pain in left groin.	Op. 2-2-26. Left cryptorchism; atrophic testicle partially undescended; hydrocele of cord; posterior to which was a left inguinal hernia; sac contained omentum.	Commission ruled: Liable. Traumatic hernia because wall of hernia was thin, omentum was non-adherent and there were no external adhesions.

(Continued on next page)

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No.	Case No.	Age	History of Venereal Disease	Alleged Etiology	Findings	Comment
28	*IAC 8001 6-8-20	51	Gonorrhea 31	Frequent attacks of cystitis, 3 in preceding 5 mos. For 5 years lump size of walnut in epididymis. Twisted back. No heavy lifting. Testicle sore that night, four times normal size in morning.	Hydrocele for 20 yrs. that would become sore and enlarge whenever he did heavy work.	Commission ruled: Lifting and carrying a heavy door caused an exacerbation of preëxisting quiescent an exacerbation of hydrocele. Op. April, 1920.
29	*IAC (L. A.) 1077 4-10-15	18	?	Fall from bicycle. (One brother operated at 13 for hydrocele due to bicycle riding.)	Fell from bicycle in race 1913. Thrown on car track Jan. 1914, and August 1914. Double hydrocele 5x1½".	Commission ruled: Take nothing. Op. 10-8-15.
30	*IAC 17585 12-27-24	26	?	Struck scrotum with auto crank.	April 1925, left hydrocele tapped twice. Bilateral epididymitis, tbc(?) 4-29-25 Bilateral epididymectomy. Pathology: Chronic inflammation and not tuberculosis.	"The epididymitis has been aggravated by the trauma of his occupation and the right side is definitely secondary to the trouble on the left. (Urological consultant). Ruling: Total temporary disability, traumatic bilateral epididymitis.

*Industrial Accident Commission.

and the cavity be obliterated, but as a rule this is not complete and there is formed a lobulated sac with partitions of scar tissue. Unfortunately such treatment is generally followed by a painful recrudescence of the epididymitis. Five per cent mercurochrome-220 is the most satisfactory drug to use as it is painless, not causing epididymitis, and the result is apparently either an immediate cure or a frank failure. Tapping is justified in old men but rarely in young. However, the only satisfactory scientific way to handle a hydrocele is to first cure the underlying condition responsible for the blocking of the lymphatics and then surgically remove the sac that holds the dammed-up fluid.

REPORT OF CASES

The material used in this study consists of twenty-four private and industrial cases seen in consultation before or after operation, and the records of six in the files of the California Industrial Accident Commission. An analysis of the thirty cases of so-called traumatic hydroceles shows:

Age.—From ages 17 to 68.

Venereal History.—Nine admitted a gonorrheal history, 16 denied all venereal diseases, and five were not asked. Twenty-one had rectal examinations made, and in all cases clumps of pus were expressed from the prostate and seminal vesicles.

Alleged Etiology.—Trauma to testicle, 8; trauma to groin, 4; straining at stool, 1; strain of lifting, 7; "foot slipped," 2; rolled down mountain-side, 1; horseback riding, 1; riding on truck, 1; bicycle riding, 1; strain of continually walking up and down stairs, 1; strain of jumping, 1; un-

known, 2. (Five thought that previous hernia operations might have had some effect.)

Etiology.—

Prostatitis and seminal vesiculitis.....	17
Chronic irritation:	
(a) Horseback riding	2
(b) Bicycle riding	1
Sarcoma	1
Herniotomy	1
Tuberculous epididymitis	3
Cryptorchism	1
Hematocele	1
Unknown (no genito-urinary examination made).....	3
Trauma	0

SUMMARY

1. Hydrocele is due to an inflammatory blocking of the draining lymphatics, secondary to disease of the scrotal contents.

2. There is no authority, or even inference of knowledge, that entitles one to attribute the cause of any disease to trauma, and *whenever trauma is offered as the cause of a disease the proponent should prove his claim, and this cannot be done without substituting faith for science.*

3. As urologists we are not interested in the spread of socialistic medicine by state agencies, nor any arguments as to the justice or racial benefits of same, but we are vitally concerned in keeping honest the etiology of diseases as worked out by this and preceding generations.

4. Unfortunately the industrial accident rulings are made by laymen, and in a recent report of a commission great credit is claimed for the number of sick and injured individuals brought within the fold of this remedial legislative act by "ingenious theory and broad interpretation." When

did it become necessary for laymen to advance medical theories?

5. Recognized pathological postulates and not politico-medico-legal rulings of industrial accident commissions should decide the causes of diseases.

6. Expediency and economic factors encourage a tendency of the industrial surgeon to ignore the fundamental underlying infection and to emphasize strains or bruises and the long discredited hypothesis of "*locus minores resistentiae*" whenever a workman complains of a sore back or swollen testicle, or even a gonorrheal urethritis.

7. Thirty case reports of "traumatic hydrocele" were analyzed, and the only one clearly due to acute trauma was a hematocele, while chronic irritation (horseback and bicycle riding) was probably responsible for three cases. Epididymitis secondary to seminal vesiculitis was the common cause, the trauma merely calling attention to a predestined developing condition.

490 Post Street.

DISCUSSION

OTTO R. FRASCH, M. D. (315 Montgomery Street, San Francisco).—The dividing line between accident and disease as a cause of a pathologic condition present is rather vague in many cases. Since an increasingly large number of people now receive monetary compensation in some form for accidental injuries—which they do not receive if the condition is due to the effects of disease—an attempt to determine more definitely the etiology of such cases is desirable.

Hydrocele is a condition which the patient usually attributes to some direct or indirect trauma. He is frequently supported in his claim by his attending physician, who in many cases has attached considerable importance to the patient's story of trauma and has omitted to secure a complete urological examination. No satisfactory explanation of the mechanism by which a hydrocele may form following indirect trauma, such as the strain of lifting or slipping, has been offered. Direct trauma, independent of disease, would have to be of sufficient violence to produce a hematoma within the tunica vaginalis, and such a trauma would produce external visible signs of violence at the time of injury and be accompanied by severe subjective symptoms. The injured person usually, however, gives a history of a relatively minor trauma, and when the report of a physician who saw him soon after the accident is available there is usually no mention of external visible evidence of severe violence. A more complete urological examination in such cases will practically always reveal an underlying epididymitis and prostatitis. The degree to which trauma may aggravate a disease condition is difficult to determine. Given the disease condition, the hydrocele may develop without the trauma, and a hydrocele of any size naturally makes the parts more susceptible to injury.

GEORGE W. HARTMAN, M. D. (999 Sutter Street, San Francisco).—Consideration of the speaker's data immediately impresses one with the fact that the majority of patients whose presenting complaint was hydrocele had prostatitis and seminal vesiculitis as well. In nine instances this was secondary to gonorrhea. In the few cases not traceable to these causes there were other conditions, such as tuberculosis, sarcoma, and undescended testicle. This series of cases, though small, represents a cross section of the hydroceles which present themselves in practice, and I believe that the author has made his point that the condition is not caused by trauma alone.

Hydrocele is one of the most frequent conditions met in operative urology. It is surprising, in con-

sideration of the number of posterior urethral infections which exist, that it is not seen more often.

Recent study has shown a surprising frequency for infections of teeth, tonsils, nasal passages, and other parts of the body to metastasize in the prostate and seminal vesicles and exist thereafter, unrecognized for prolonged periods, until a careful routine examination discloses them. It is quite possible, under these circumstances, that a mild chronic epididymitis may be produced. In 90 per cent of the hydroceles exposed, the epididymis is found to be the seat of acute or chronic infection. The hydrocele itself may develop slowly and be accentuated by a trauma. Even the so-called traumatic hydrocele of the horseback rider may be secondary to infections elsewhere which, unrecognized in the past, have aroused the suspicion of venereal infection.

Attention is called to the fact that not all chronic epididymites give rise to hydrocele. On the other hand, there are many cases of trauma reported in which there is no hydrocele produced. Should the trauma be sufficient to cause a hemorrhage, one would expect all of the accompanying signs and symptoms.

The question still remains to be settled whether, in the presence of a chronic infection in the prostate and seminal vesicles, an injury causing temporarily great increase in intra-abdominal pressure would be sufficient to carry infection downward, causing epididymitis and subsequent hydrocele. Instances of this sort have been observed.

The postoperative enlargement of the scrotal contents, due to the excision of the hydrocele sac, may be reduced rapidly by the application of diathermy. Hydrocele appearing after operation for hernia or varicocele usually disappears after one or two tapplings.

The speaker's work is well timed. Medicine marches on progressively through error into scientific fact. At times it is almost as difficult to convince the medical as the lay public, but ultimately the truth will prevail.

✽

F. S. DILLINGHAM, M. D. (320 Merchants National Bank Building, Los Angeles).—The essayist has given us a complete description of hydrocele, covering every phase from history, etiology, pathology, symptomatology and treatment.

I was particularly pleased that he mentioned metastatic infections. So many recognize gonorrhea or tuberculosis as the underlying cause, but are not aware or will not admit that infections of the prostate, vesicles, or epididymis may be caused by some focus.

Szenkier reports an abscess of the prostate in a boy two and a half years old following typhoid fever. Trauma from the rough passage of urethral instruments has caused many a case of epididymitis.

My experience with insurance companies and others is that they blame the gonococcus when the microscope and cultures show only staphylococcus infection.

The original infection may have occurred years before and, causing no symptoms, be forgotten until one of the forms of trauma described in the paper supposedly causes a hydrocele. In every patient operated for varicocele, as a prophylactic, I believe it wise to operate the tunica vaginalis also so as to avoid the possibility of a hydrocele later.

As has been brought out by others, many severe blows on uninfected testicles (as in the game of handball) are not followed by epididymitis or hydrocele, while it usually follows if the student gives a history of past infection.

✽

DOCTOR WESSON (Closing).—The discussion has emphasized three points: (1) Nonvenereal (metastatic) prostatitis is very common but generally overlooked because the prostate is not investigated in the absence of a history of gonorrhea. (2) Ingrained medical folklore is often as hard to eradicate from the physician's mind as from the layman's. (3) Hydrocele is not due to trauma, but to infection.

DEAFNESS AND THE CHILD*

REPORT OF CASES

By LAWRENCE K. GUNDRUM, M.D.
Los Angeles

DISCUSSION by Frank H. Rodin, M.D., San Francisco;
F. F. Gundrum, M.D., Sacramento.

EAR, nose and throat specialists in recent years have shown renewed interest in the problems of hearing. This interest has been stimulated in part by new instruments of precision made possible largely by the work of a few American physicists. These instruments aid in making an earlier diagnosis possible. Precise measurements now make it possible to detect the beginning of a hearing impairment five or even ten years before the deafness would be noticed by the patient or the patient's friends. In this way it is hoped that the pediatricist or otologist may "steal a march" on the insidious process and perhaps arrest it before permanent changes have taken place. There is nothing more lamentable than a deaf adult who has fixed changes. How very difficult it is to aid a great many such patients who come for treatment of deafness is known to all; it is only in the plastic stage of youth that one can expect any marked benefit from treatment.

VALUE OF PRECISION INSTRUMENTS

The Western Electric Company has an audiometer available for the accurate measurements of hearing. The special instrument used in this work was devised by Isaac H. Jones and Vern O. Knudsen, and has been called the audio-amplifier. This instrument has certain advantages; principally the use of the amplified conversational voice, the amplified whispered voice, and the determination of percentage of bone conduction. It is true that the mere percentage measurement of the various tones does give an accurate measure of the degree of hearing; but the amplified voice and the percentage of bone conduction go further than the determination of the hearing percentage, and give more exact information as to the diagnosis of the nature and location of the hearing defect. It has long been known that lower percentages of hearing for the lower tones suggest that the patient is beginning to have an impairment due to a lesion of the middle ear. If in addition the amplified voice is heard distinctly and if the bone conduction is 105 per cent or 110 per cent for the low frequencies, the diagnosis of such an impairment is established by the removal of tonsils and adenoids for correction of the other defects of the nose, throat and middle ear. The defect can be arrested before the changes become permanent. On the other hand, if the upper limit is reduced from 20,000 d.v. per second to 12,000 d.v. or 10,000 d.v. per second or less it is probable that the patient has a lesion of the cochlea or of the cochlear portion of the eighth nerve. Now if the bone conduction is well below normal, 90 per cent or 85 per cent or less,

and if the amplified voice is not distinct and sounds confused to the patient, a definite diagnosis of nerve defect can be made. This leads to a search for foci of infection, for constitutional disease such as syphilis, or for a history of an infectious disease such as scarlatina, mumps, or other toxic condition.

CONDUCTIVE AND PERCEPTIVE DEAFNESS

It is customary to classify deafness into two broad subdivisions: one, those in which the impairment is in the conducting mechanism of the external or middle ear, the apparatus which conveys the sound waves from the outer world into the internal ear; and two, those in which the lesion is in the nervous apparatus of the cochlea or eighth nerve. On that account, these two distinctly different conditions have long been referred to as "conductive" and "perceptive" lesions.

STUDIES HERE PRESENTED

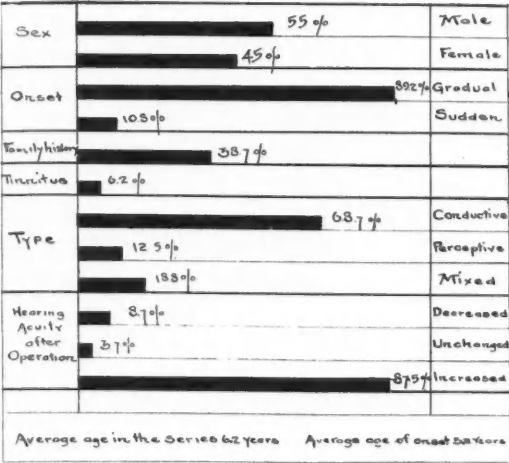
The studies presented in this paper are in the form of a preliminary report. For simplicity, and for statistical study, it seemed best to make measurements of a series of patients with impaired hearing before and after the removal of tonsils and adenoids. The patients were from the California Babies Hospital, from the outpatient department of the Eye and Ear Hospital of Los Angeles, and from the private practices of myself and associates. Two hundred and forty cases were examined before the treatment. Unfortunately only eighty reported for examination afterward. An attempt was made to have the patients report one month after operation, then at intervals of three months for one year, as it was thought that the maximum of improvement would be reached in one year. It was difficult to persuade the patients to return for re-observation; the parents for the most part, feeling when the children were improved, they need not bring them back, or if they did would bring them for only one or two rechecks. Of course no absolute conclusions can be drawn from those who failed to report. However, within reasonable limits it seems probable that parents are more apt to return with a child that was not improved than with one that was much better or with one that they considered cured.

CHART INTERPRETATIONS

Chart 1 shows the results of those in which postoperative examination was completed. Forty-four (55 per cent) were in males and thirty-six (45 per cent) in females. The average age was 6.2 years, the youngest patient being three years and the oldest fifteen years. The age of onset was difficult to determine. In a number of cases no deafness was noticed by the parents. In many of these the parents thought the child "inattentive," whereas a real hearing impairment was the cause of the "inattention." In some cases the parents themselves were deaf. For example, one patient, when first examined, had a slight purulent discharge from the right ear and a large polyp protruding through the perforated drum membrane. Average tonal hearing was 66 per cent in the

* Read before the Pediatrics Section, California Medical Association, at its Fifty-Seventh Annual Session, April 30 to May 3, 1928.

CHART 1.—Showing Percentages in Patients Seen Pre- and Postoperatively



right ear and 69 per cent in the left. The father has otosclerosis and the mother a moderate conductive impairment; so that both parents, while intelligent and observant, had failed to notice the marked deafness in the child. In twelve cases, deafness was first noticed when the children entered school. For those whose age of onset could be determined the average was 5.2 years. In fifty (89.2 per cent) the onset was gradual, in six (10.8 per cent) sudden. In three the beginning dated definitely from an attack of scarlatina, one from pertussis, one from influenza and one from

measles. Two followed acute mastoiditis and two were attributed to accidents. In thirty-one (38.7 per cent) there was a family history of deafness.

Tinnitus was a rare symptom. It was present in only five (6.2 per cent) cases. This is very much in contradistinction to findings in deaf adults. Jones and Knudsen in a series of cases found that in considerably more than half of both conductive and perceptive impairments, tinnitus was a prominent symptom. In many adults the deafness is of minor importance compared with the continuous annoying tinnitus. In a few cases actual destruction of the eighth nerve has been resorted to in the attempt to relieve this condition. Yet in two hundred and forty children examined, tinnitus was not the symptom for which relief was sought. It would therefore seem that this symptom is usually produced by a lesion of longer standing. Fifty-five cases (68.7 per cent) were conductive in type, ten cases (12.5 per cent) were perceptive, and fifteen cases (18.8 per cent) showed mixed conductive and perceptive impairment.

The audio-amplifier tests were made immediately before the tonsil and adenoid operations. Some patients were reexamined one month after operation, whereas others could not be located or reexamined until eighteen months later. These statistics show that seven (8.7 per cent) were definitely worse, showing less hearing function than before operation. There was no change in three patients (3.7 per cent); seventy patients (87.5 per cent) showed improvement. Of the seven patients who were worse after operation, the decrease ranged from 3 per cent to 20 per cent. Three patients never returned and in these

CHART 2.—Summarizing Data in Case Reports

CASE NO.	DATE	AGE	Amplified VOICE		Whispered VOICE		TONAL AVERAGE		UPPER LIMIT		BONE Conduction		TREATMENT AND RESULTS	DIAGNOSIS
			Right	Left	Right	Left	Right	Left	Right	Left	Right	Left		
I	April 25, 1925	10	Distinct	Distinct	70%	75%	75%	71%	12500	12500	116%	114%	Tonsil and Adenoid Operation April 30, 1925 Increase 12% Right Increase 23% Left	Bilateral, conductive impairment
	Sept. 11, 1926		Distinct	Distinct	93%	96%	88%	94%	20000	20000	89%	97%		
II	May 5, 1926	5	Distinct	Distinct	87%	97%	67%	73%	20000	16384	100%	102%	Tonsil and Adenoid Operation May 7, 1926 Increase 16% Right Increase 9% Left	Bilateral, conductive impairment
	Sept. 14, 1926		Distinct	Distinct	100%	100%	83%	82%	20000	20000	84%	83%		
III	June 8, 1926	6	Fairly Distinct	Confused	73%	69.5%	65.9%	66.2%	9000	9000	60%	88%	Tonsil and Adenoid Operation October 24, 1926 Increase 5.8% Right Increase 3.3% Left	Bilateral Perceptive Impairment
	June 6, 1927		Distinct	Distinct	80%	73%	71.7%	69.5%	20000	20000	96%	91%		
IV	May 27, 1926	7½	Distinct	Distinct	60%	87%	66%	72.6%	20000	20000	112%	112%	Tonsil and Adenoid Operation August 27, 1926 Increase 5.8% Right Increase 16.8% Left Decrease 12.4% Right Decrease 17.5% Left	Bilateral Conductive Impairment
	Sept. 7, 1927		Distinct	Distinct	83%	97%	71.8%	89.3%	20000	20000	109%	104%		
	June 28, 1928		Distinct	Distinct	60%	75%	59.4%	71.8%	20000	20000	102%	101%		
V	March 3, 1926	11	Fairly Distinct	Fairly Distinct	70%	67%	44.2%	40.6%	13000	13000	95%	105%	Tonsil and Adenoid Operation April 7, 1926 Increase 24.8% Right Increase 21.1% Left	Mixed Perceptive and Conductive Impairment, Bilateral
	Jan. 3, 1927		Distinct	Distinct	77%	70%	69%	61.7%	20000	20000	100%	106%		
VI	Feb. 28, 1927	10	Distinct	Distinct	87%	100%	88%	91.3%	20000	20000	112%	112%	Tonsil and Adenoid Operation March 1, 1927 Decrease 6% Right Decrease 18.8% Left	Conductive Impairment Bilateral
	June 28, 1928		Distinct	Distinct	87%	93%	82%	72.5%	20000	20000	112%	112%		

we were unable to discover a cause for the decrease in the hearing acuity. Four were private patients and are still under treatment for sinusitis. The improvement in those patients who were benefited varied from 5 per cent to 25 per cent. As would be expected, the greatest increase was generally in inverse ratio to the age of the patient; the younger the patient, the greater the benefit. Also those with markedly enlarged tonsils and adenoids were usually much more improved. Chart 2 shows some typical cases.

REPORT OF CASES

CASE 1.—Refers to a typical conductive case. The amplified voice was heard distinctly, the low tones were the most diminished, the bone conduction was greatly increased, averaging 116 per cent in the right and 114 per cent in the left ear. Tonsil and adenoid operations were done on April 30, 1925. Patient reexamined September 11, 1926. As is shown in the chart, there is an increase in the right ear of from 75 per cent total average to 88 per cent, an increase of 13 per cent, and in the left ear from 71 per cent to 94 per cent, or an increase of 23 per cent.

CASE 2.—Refers to an interesting case of conductive impairment. Tonsils and adenoids had already been removed. Infected lymphoid tissue was found behind the tonsillar pillars and in the pharynx. Each follicle was carefully dissected away exposing the nasopharynx by means of a soft rubber catheter passed through the nose. Three months later the percentage in the right ear changed from 67 per cent to 83 per cent, and in the left ear from 73 per cent to 82 per cent. This case is unusual in that the indications for surgical procedures were of such minor nature, and yet it is now evident that these very small bits of infected tissue were the cause of her repeated colds which were producing subacute changes in the middle ear, which if left alone for a number of years would, no doubt, have become permanent.

CASE 3.—Refers to a patient who had a perceptive lesion. The mother had noticed hearing impairment in the child for only one year. Probably it had been present much longer. It is interesting to note the almost exact hearing for each tone for each ear. It will be noticed that the amplified voice was heard only fairly distinctly in the right ear and was confused in the left. The high tones were more affected than the low ones, the upper limit was 9000 d.v. per second in each ear instead of the normal 20,000 d.v. per second, and the bone conduction was below normal. The patient had infected tonsils and adenoids. It was felt that this was the focus of infection causing the hearing impairment. The tonsils were removed October 24, 1926. On June 6, 1927, or seven months later, some improvement had taken place. The amplified whispered voice was heard distinctly. The average hearing for tones in the right ear was 71.7 per cent, in the left was 69.5 per cent, whereas the previous tests showed 65.9 per cent in the right, and 66.2 per cent in the left.

CASE 4.—Shows a typical conductive case with typical findings. The right ear averaged 66 per cent for the tones, the left averaged 72.6 per cent. Tonsils and adenoids were removed August 27, 1926. The next test, made fifteen months later, shows an average of 71.8 per cent for the right and 89.3 per cent for the left, or an average improvement of 5.8 per cent for the right and 16.5 per cent for the left. On November 28, 1927, the patient had an attack of mumps. On January 28, 1928, another test was made and it was found that the right ear showed 59.4 per cent average total hearing or a decrease of

12.4 per cent, and the left an average of 71.8 per cent, or a decrease of 17.5 per cent. This illustrates how the hearing defect can result from a toxemia produced by an infectious disease.

CASE 5.—Is representative of a very severe type of mixed conductive and perceptive impairment. The amplified voice was heard only fairly distinctly in both ears. The lower tones were most affected. The upper limit was 13,000 d.v. in both ears, the bone conduction was slightly below normal in the right and slightly above in the left ear. Tonal average for the right was 44.2 per cent, for the left 40.6 per cent. Tonsillectomy and adenoidectomy were done April 7, 1926. Test made on July 7, 1927, exactly fifteen months after operation, shows an improvement average of 24.8 per cent in the right ear and 21.1 per cent in the left, or more than 50 per cent increase of the original hearing.

CASE 6.—Is a case of conductive impairment which was much worse one year after operation. The onset came on suddenly during acute mastoiditis two years before. There is a loss of 6 per cent in the right and 18.8 per cent in the left ear. The patient was found to have a chronic purulent posterior ethmoidal sinusitis for which she is being treated, in the hopes of clearing up the hearing impairment.

COMMENT

In general it has been considered that the removal of tonsils and adenoids was beneficial to hearing. Precise measurements have shown us that this improvement was more marked than suspected. In other words we did not know that the hearing was benefited to such a degree.

One gets the impression from the limited work here presented that in the future we shall find that a not inconsiderable number of cases of incipient deafness can be arrested. Of one thing we are sure, and that is that the best way to "cure deafness" is to prevent it.

1116 Wilshire Medical Building.

DISCUSSION

FRANK H. ROBIN, M.D. (490 Post Street, San Francisco).—If we are to secure any improvement in impaired hearing it is necessary to remove the cause as early as possible. As Doctor Gundrum has stated: "The greatest increase was generally in inverse ratio to the age of the patient; the younger the patient, the greater the benefit." Early stages in defective hearing are not often noticed by either parents or teachers. As Doctor Gundrum has observed: "The parents thought the child 'inattentive,' whereas a real hearing impairment was the cause of the 'inattention.'"

The Western Electric Company's phonograph audiometer, by which forty children can be tested at one time, makes it possible to find early the cases having defective hearing. In San Francisco 30,742 school children were examined with the phonograph audiometer and 2782, or 9 per cent, were found to have a loss of nine or more sensation units in one or both ears. A sensation unit corresponds to .83 of 1 per cent hearing loss for speech. Of these 751 were found to have some correctible ear defect. Four hundred and five children had such a marked loss of hearing that they were recommended for lip-reading instruction. It is by finding early the children with a hearing defect that we may reduce the number requiring lip-reading and prevent deafness, with fixed changes in the ears, later in life.

Pediatricians and otologists have known of the remarkable improvement in hearing that may take place after the removal of tonsils and adenoids. As far as I know, Doctor Gundrum is the first to actually study such cases with an audiometer before and after a tonsillectomy and show graphically the improve-

ment that may be obtained after the removal of infected foci in the upper respiratory passages.

Of course not every child with defective hearing will improve on the removal of the tonsils, but every child who has a hearing loss should have a careful physical examination to determine if possible the cause of the condition. An examination which includes the study of the lower and upper tones, as suggested by Doctor Gundrum, is often helpful in determining whether the cause is due to an upper respiratory condition or to some other focus of infection.

Doctor Gundrum is to be commended for drawing the attention of the pediatricians to the fact that an early defect of hearing can readily be detected and often improved surgically.

F. F. GUNDRUM, M. D. (Medico-Dental Building, Sacramento).—Doctor Gundrum's paper is timely. It brings again to our attention the great desirability of instituting preventive measures in childhood where opportunities for correction are so much greater than in the adult. It seems to me that any method which allows for an earlier appreciation of developing handicaps is to be received with approval and its use extended.

THE LURE OF MEDICAL HISTORY

JOHN BOSTOCK (1773-1846)

Author of the First Clinical Description of Hay Fever

By SAMUEL H. HURWITZ, M. D.
San Francisco

ON March 16, 1819, Dr. John Bostock, an English physiologist and clinician, read a paper before the Royal Medical and Chirurgical Society of London on a "Case of a Periodical Affection of the Eyes and Chest"¹ in which he presented to the members the history and clinical symptoms of a seasonal affection which had troubled him since childhood. Nine years later² he gave a more detailed account of the disease, applying to it the noncommittal name of "catarrhus aestivus" or summer catarrh, although the affection had, since his earlier publication, obtained the popular name of hay fever.

The recognition of hay fever as a clinical entity dates from Bostock's description of his own symptoms, a fact which has been recognized by the German school in giving to hay fever the designation, Bostock's catarrh. Even though Bostock's achievement is somewhat dimmed by his failure to discern that pollen was the cause of hay fever, the credit for its first clinical recognition justly belongs to him. It is very doubtful whether certain forms of seasonal catarrh described by medical writers in the sixteenth, seventeenth, and eighteenth centuries were genuine instances of hay fever. The cases of Botallus of Pavia (1565) and Binningerus (1673) are often referred to in the literature in support of the view that hay fever was first described several hundred years before Bostock. The former tells of patients who had an intense aversion to roses, since their odor caused them headache, itching of the nose and sneezing, and the latter reports the case of a woman who every year, for a period of several weeks, had symptoms of coryza when the roses bloomed.³ Although it is highly probable that hay fever had occurred long prior to the time when it was first



JOHN BOSTOCK, M. D.

noticed by medical writers, it appears to have been mistaken as a mere modification of the common catarrh. This is not remarkable when one reflects that up to the time of Sydenham, in the seventeenth century, rheumatism and gout had been regarded as one and the same disorder and that these diseases have less similarity and are more distinct in their characteristics than are hay fever and common coryza.

Bostock, who was somewhat of a medical historian himself, states in his paper: "One of the most remarkable circumstances respecting this complaint is its not having been noticed as a specific affection until within the last ten or twelve years. Except a single observation of Heberden's, I have not met with anything that can be supposed to refer to it in any author, ancient or modern." The observation of Heberden to which Bostock refers is to be found in his Commentaries, that great mine of keen medical observation which was the result of a lifetime of conscientious note-taking.⁴ Speaking of this form of catarrh, Heberden states: "I have known it to return in four or five persons annually in the months of April, May, June, or July, and last a month with great violence."

Although the name of John Bostock will be remembered for his clinical description of hay fever, it is for his contributions to physiology and physiological chemistry that he was held in high esteem during his lifetime. Pettigrew,⁵ in his Biographical Memoirs, has given an excellent narrative of the life and work of John Bostock. Born in Liverpool in 1773, Bostock followed in the footsteps of his father, a practicing physician in that city. In his twentieth year he commenced the study of medicine by spending some time with an

apothecary in order to become familiar with pharmacy; and afterward by attending the practice of the Liverpool General Dispensary. After several years devoted to the study of anatomy in London and of chemistry in Edinburgh, he took his medical degree at the latter university in 1798, when twenty-five years of age. His thesis on this occasion was upon secretion. On leaving Edinburgh Bostock settled in his native town and was elected one of the physicians to the Liverpool General Dispensary and, with Dr. James Currie, an eminent practitioner of that city, took an active part in planning and establishing the Fever Hospital. It would appear, however, that he devoted more time to the study of botany, physiology and chemistry, and to the writing of many papers for vari-

tion of his "Inquiry into the Causes and Effects of the Variolae Vaccinae" and, although it was already fully appreciated that no discovery in medicine was more important to the interests of humanity, yet its practical application in England, as in our country today, was far from general. If Doctor Bostock was present at the meeting of the Medical and Chirurgical Society on November 10, 1819, he heard his colleague, Sir Gilbert Blaine, read a paper on the value and present state of vaccination, in which he stated that "it is one of the reproaches of the country that it has not availed itself so much as any other, of the benefits of vaccination."

When Bostock came to London in 1817, two of John Hunter's famous pupils, Abernethy and Astley Cooper, both in their fifties, were at the height of their careers. The latter had already been surgeon at Guy's Hospital for seventeen years, where he made his epoch-making contributions to the surgery of the vascular system, and Matthew Baillie, who twenty-five years before had written his famous "Morbidity Anatomy," was now physician to George III, one of the busiest consultants in London and the last to inherit the "Gold-Headed Cane."

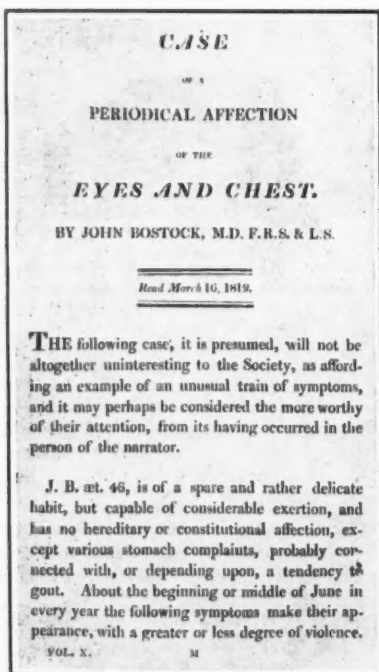
As one of the lecturers on chemistry at Guy's Hospital, Bostock had an opportunity to know intimately two of its brilliant young physicians, Thomas Addison and Richard Bright; the latter became physician to Guy's Hospital in 1820, where he worked for six hours daily in the wards and postmortem room, efforts which were crowned in 1827 by his original description of essential nephritis, which made the name of Bright a household word throughout the world. Doubtlessly stimulated by Bright's work on nephritis, Bostock made chemical analyses of the properties of the urine in many patients with Bright's disease, and he was the first to discover the presence of an excess of urea in the blood of patients suffering from certain diseases of the kidneys.⁵

Bostock's most noteworthy contributions were made in physiology. His work entitled "An Elementary System of Physiology," published in London in 1823, passed through three editions and was the first systematic and connected view of modern physiology that had been published in England. This and his numerous researches on the chemistry of the body fluids show him to have been "characterized by a bold and ingenious spirit of inquiry."

490 Post Street.

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ous medical and scientific journals than he gave to practice. In fact in 1817 he gave up the practice of medicine and determined to devote his attention more particularly to the study of physiology. At the age of forty-four he moved from Liverpool to London. In making this change he was principally influenced by the greater facilities which the metropolis afforded for the pursuit of his chosen work, and for the enjoyment of the society of his scientific friends.

The London group of physicians into whose circle Bostock now entered were among the most famous of the century. The roster of the Royal Medical and Chirurgical Society of that time contains such names as Jenner, Astley Cooper, Matthew Baillie, Abernethy, Benjamin Brodie, Charles Bell, Thomas Young and the "great men of Guy's," Richard Bright and Thomas Addison. Jenner was at that time sixty-eight years old. About twenty years had elapsed since the publica-

CLINICAL NOTES AND CASE REPORTS

MESENTERIC CHYLOUS CYST*

REPORT OF CASE

By EDWARD J. LAMB, M. D.
Santa Barbara

THE article, "Mesenteric Chylous Cysts," printed in the April 1929 edition of CALIFORNIA AND WESTERN MEDICINE, by Dr. L. A. Alesen, has prompted me to report the following case.

The etiology of chylous cyst is obscure, the occurrence of these cysts is rare, and the signs and symptoms at present are not well defined.

Considering the rarity of this condition the following case is reported:

REPORT OF CASE

History.—Mario B., white male, age five years, born of Italian parentage, first seen in consultation with Dr. Hugh Freidell on December 15, 1928. The family history was essentially negative. The parents were in good health. There was no history of miscarriages or any familial chronic diseases.

The patient was a full-term baby, normal birth, neonatal and infantile health was good. The patient had had an attack of abdominal cramps and some abdominal distention about one year ago from which he recovered without medical aid. The child gave no history of intestinal indigestion.

Physical Examination.—A well-developed and fairly well nourished child five years of age, tossing about in bed, suffering from excruciating pains located in the region of the umbilicus. The child was holding his hands on the abdomen as if suffering from severe abdominal cramps, and periodically shrieked with pain. Temperature, 100. Pulse, 98. Respiration, 20. Chest examination negative. Abdomen greatly distended, tympanitic on percussion. No abdominal spasm, slight rigidity, and well-marked tenderness over the entire abdomen. Liver and spleen were not palpable. Rectal examination negative. Extremities in no fixed position. Reflexes were normal.

Laboratory Findings.—White blood count: 25,600 with polymorphonuclear neutrophils 89 per cent; large lymphocytes, 4 per cent; small lymphocytes, 5 per cent; large mononuclears, 2 per cent. Urine, catheterized specimen: albumin trace; sugar, slight trace; acetone, heavy trace; diacetic acid, heavy trace; no pus cells or other microscopic findings.

Diagnosis.—General peritonitis, secondary to strangulation or intussusception of bowel.

An exploratory laparotomy was performed by Dr. M. Thorner.

Operation.—(By Doctor Thorner) "Anesthesia under gas ether. Right rectus incision was made. No free fluid was found, but a cyst of large size, fully a litre, presented, which proved to be a cyst of the mesentery of the lower part of the jejunum, which separated the leaves of the mesentery up to the bowel and completely flattened out the jejunum like a ribbon over its circumference. The mesentery was twisted with ecchymotic areas, with the cyst lying across and compressing the transverse colon. The entire colon was considerably congested though there was no free fluid in peritoneal cavity and no gangrene of intestines. Appendix was found not outwardly inflamed and was ablated. Cyst was excised together with intervening collapsed jejunum. Both ends of jejunum were closed and a lateral anastomosis was made.

Abdominal wound closed without drainage. Hypodermoclysis of normal salt solution was administered. Patient stood the operation well. Was given hypertonic salt solution (3 per cent) and glucose per rectum.

"On December 16 was seen in the morning. Pulse good; and patient's condition was apparently good at 9:30 o'clock. Urine, only two ounces, obtained by catheterization, contained acetone and diacetic acid. One-half an hour later when seen, patient was in collapse and died at 4 p. m."

Pathological Report.—(R. D. Evans, M. D.) Gross: The specimen is a partially distended cyst containing five lobules, which are in communication with one another at a central point. Over all the cyst is 20 by 20 by 5 centimeters. The wall is gray brown, translucent, smooth, and thin. The fluid is golden yellow, and contains yellow droplets which glisten in the light. It contains approximately 1000 milliliters. Gram-stained preparations of the fluid showed no evidence of the presence of any bacteria.

The appendix vermiformis is eight centimeters long, serosa pink gray, lumen patent, and mucosa red. Coursing over the surface of the sac is a strip of small bowel ten centimeters in length in the collapsed state; and the two ends of this are tied close together in the pedicle. Bowel is five centimeters in circumference, and its lining is somewhat smooth.

Diagnosis.—Mesenteric cyst.

1515 State Street.

ADENOCARCINOMA IN A FOURTEEN-YEAR-OLD BOY*

REPORT OF CASE

By ANDREW S. DAVIS, M. D.
Oakland

CANCER in youth and adolescence is rare. Students of medicine are so imbued with the idea that cancer never occurs before forty that such is accepted as a maxim. This erroneous view is directly responsible for many unsuspected lesions being first diagnosed at operation or necropsy. Adenocarcinoma does occur at relatively early ages, being the tumor of most frequent occurrence during the second decade of life, and of less prominence during the third.¹ Hennig² observed twelve cases among one million living children under the age of fifteen years; and subsequent to his observations, twenty-one instances have been reported in the literature occurring under fifteen years of age.

The colon is the common site of malignant growths in the digestive tract; the rectum being the site most often of true cancer. Five and a quarter per cent³ of all carcinomas occur in the rectum. This figure places the rectum as fifth in the list of primary seats of cancer.

Transient injury is oftentimes given as a possible etiologic factor in reports on adenocarcinoma. It is very doubtful if malignant changes ever result from a single trauma, although they may follow continuous or repeated irritation to a definite structure.

A generation ago the laity believed that all tumors came from trauma, and every woman with a cancer of the breast remembered when she was pinched or kicked by a nursing infant. Everybody has been subject to many forgotten

* From the Children's Clinic, Santa Barbara.

* Read before the Saint Francis Hospital staff meeting.

* Read before the Alameda County Medical Society, June, 1928.

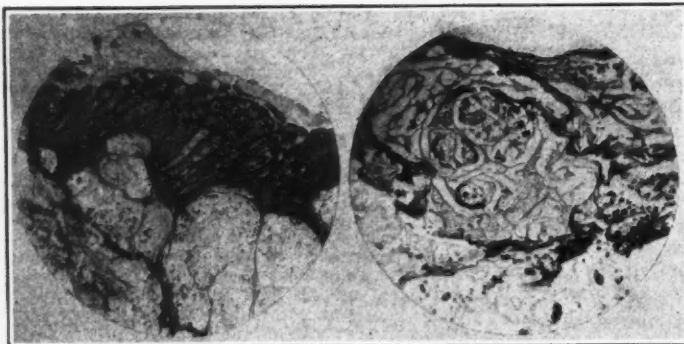


Fig. 1.—Actively growing tumor with epithelial cell nest and marked mucoid degeneration.

Fig. 2.—Malignant invasion in omentum. Cell nest and inflammatory tissue present.

blows, and the trauma to which a cancer is attributed is too often an eagerly remembered incident.

SYMPTOMS

Paramount in symptomatology is: constipation; constipation followed by diarrhea; diarrhea; tympanic abdomen; tenesmus; dull pain; colicky pain; disagreeable feeling in the rectum, back and sacrum; gastrointestinal disturbances; ascites; melena; and acute ileus. Pain may be the first symptom, although one may find instances of rectosigmoid cancer without pain or any other symptom, except in the most terminal stages of the malignant invasion. Macewen's⁴ case of adenocarcinoma had no symptoms up to the night before admission to the hospital when the patient was seized with violent pain in the abdomen and persistent vomiting. An exploratory laparotomy showed an adenocarcinoma with perforation of an ulcerated gut. Death occurred a few hours after operation. In Davis's⁵ report the girl complained of colic in the right lower quadrant and as the colic persisted there developed an increasing tenderness in the region sufficient to warrant an exploratory laparotomy where an adenocarcinoma was found involving the ileocecal region. Three years later the girl was reported as enjoying good health.

The diagnosis is usually made at operation or necropsy. X-ray is not infallible, and digital examination may fail as well. Hence the rectoscope should always be used where there is suspicion of lower bowel malignancy. In the case reported below both x-ray and digital examinations were negative, therefore a rectoscopic examination was not made. Rectoscopy would no doubt have established a correct pre-operative diagnosis.

TREATMENT

Surgery is the only satisfactory treatment, and it is not effective except when the

condition is discovered in its incipency. The use of the x-ray and radium are still in the experimental stage.

REPORT OF CASE*

History.—W. W., male, 14, entered Saint Luke's Hospital November 23, 1926, complaining of umbilical pain of one week's duration coming on immediately after having eaten. Four days later the abdomen became rigid and distended, associated with costiveness. Family history negative for cancer and tuberculosis. The history of a blow in the abdomen twelve days before while playing football was elicited.

Physical Examination.—Pupils dilated, reaction equal. Face flushed. Supercavicular glands palpable, abdomen pendulous and rigid. Pain on palpation in the umbilical region and to right of umbilicus. There was a shifting dullness on percussion. Rectal examination showed only a large amount of impacted feces. Tentative diagnosis: Tuberculous peritonitis with ascites.

Approximately eleven litres of fluid were withdrawn in nine days. The abdomen flattened and on palpation a large round but irregular hard mass occupying the region between the symphysis and navel was palpated; other irregular masses indefinitely palpable in left inguinal and right cecal regions. Mass felt like a new growth, and its location could be determined probably by a barium enema.

Blood findings: Hemoglobin, 76 per cent (Dare); erythrocytes, 4,670,000; leukocytes, 7600; neutrophils, 68; lymphocytes, 32. Urine specific gravity, 1.030. Special examination: Aspirated fluid was injected into guinea-pig. Ten days later on autopsy, the guinea-pig showed no evidence of tuberculosis.

X-ray of chest negative. Fluoroscopic examination of injected barium was negative.

Operation.—Exploratory laparotomy, December 6, 1926. Median incision, approximately 2.5 litres of fluid escaped. Enlargement of the opening exposed a large mass extending down to the lower angle of the wound and attached to the parietal peritoneum on the left side. Mass extended across the whole upper abdomen and was attached to parietal peritoneum which was also studded with very fine nodules. On right side the mass was apparently free and could be outlined. In the right lower quadrant it seemed to extend

* Reported through the courtesy of John F. Sullivan, San Francisco.

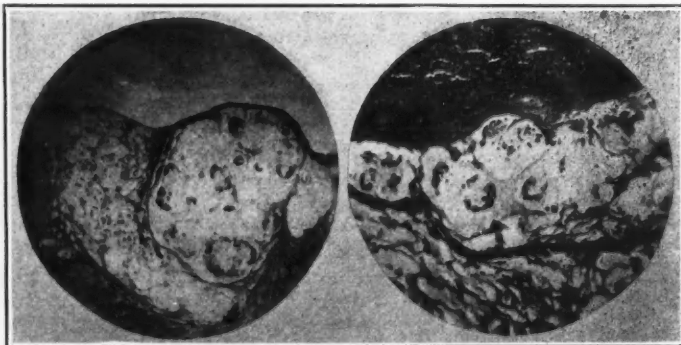


Fig. 3.—Lymph gland with large metastatic invasion showing characteristic cell nest, typical mucoid material and many mitotic figures.

Fig. 4.—Typical cell nests buried deep in muscularis surrounded by zone of mucoid material.

downward and inward to be reflected back upon the cecum. Several nodules were felt in the rectum, and from the lower angle of the wound a greater number of nodules seemed to extend over the bladder and were adherent to this viscus. One nodule was removed for examination and the abdomen closed. Frozen section: Adenocarcinoma. Died June 3, 1927.

Autopsy, June 4, 1927.—A large mass in the bowel filled the true pelvis. The organs were removed en masse and dissected. At the junction of the sigmoid-colon and rectum there was found an ulcerated area with some calcified material beneath the ulcer; also a tumor mass underlying the ulcer. Extension could be seen from this ulcerated area out into the parietal tissue. The bladder was infiltrated but negative. Both ureters were caught in the tumor mass and show a marked distention on both sides, being dilated about one centimeter each. Kidneys were normal in size and shape, capsule stripped easily and left a fairly smooth surface. Kidney showed normal differentiation on section. Histological examination showed the tumor mass to be an adenocarcinoma—mucoid type.

Diagnosis and Pathological Report.—Rapidly developing and fatal adenocarcinoma—mucoid type—of the rectosigmoid junction in a male, age fourteen years, the chief symptoms being abdominal pain, distention (ascites) and constipation.

COMMENT

This case of an adenocarcinoma of the sigmoid and rectum in a fourteen-year-old boy represents the twenty-second case under fifteen years of age. Twenty-one cases of adenocarcinoma of the large bowel have been previously reported in children.

There are fifty-five cases of cancer of the rectum and sigmoid reported in the literature in patients under twenty years of age.

Surgical treatment in early cases, as with most types of malignancy, offers the best hope for cure, but because of the lack of early subjective symptoms the diagnosis is rarely made until too late.

Single trauma is not regarded as a direct etiological factor.

In the case reported above the boy received a severe blow in the abdomen while playing football. Could trauma have been transmitted to the sigmoid from a blow in the abdomen, or a malignant growth have developed and metastasized in four weeks' time to the extent described in the findings at necropsy? Although the fulminating character of cancerous growths found in youth is startling, it is highly improbable that there is any relationship between the trauma of the football game and the adenocarcinoma found at the operation or autopsy.

9311 East Fourteenth Street.

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COCCIDIOIDAL GRANULOMA

REPORT OF CASE

By GEORGE S. KALICHMAN, M. D.

AND

LEO J. MADSEN, M. D.

Santa Monica

COCCIDIOIDAL granuloma is still, fortunately, a comparatively rare disease in man. The diagnosis is difficult for one who has never seen the disease. The condition is often confused with tuberculosis. The report of this case, with a few preliminary remarks, would seem to be justified.

The parasite of coccidioidal granuloma was first described by Rixford and Gilchrist in 1899. It is a granulomatous pyogenic disease, due to infection with the fungus, *Coccidioides immitis*, probably a member of the Oömycetes group. Walbach and others, by cultivating the *Coccidioides immitis*, showed that the original view that the parasite belonged to the protozoan group, as held by Pasadas, was erroneous.

The diagnosis of the disease is usually difficult. Like other granulomatous diseases, it may mimic anything. Jacobson calls attention to various clinical forms or types such as cutaneous, systemic, osseous, and pulmonary. When associated with ulcers or sinuses, repeated cultures, smears or scrapings, will usually reveal the spherical bodies of *Coccidioides immitis*, with their characteristic refractile, double-contoured capsules.

The prognosis is as a rule fatal, but death may not ensue for months or even years.

There is no specific treatment for this disease. Vaccines have been prepared by J. V. Kovke and Karl Meyer, but their results were not encouraging. Jacobson of Los Angeles recommends the intramuscular injection of colloidal copper, and is very enthusiastic about its effects in checking the disease.

REPORT OF CASE

P. C. M., thirty-three years of age, Spanish by birth, cement finisher by trade. Interesting features of the family history are that his mother and two sisters died of pulmonary tuberculosis. His mother died three months after his birth. Four brothers are alive and well. Patient was gassed during the World War, but evidently without apparent damage to the lungs.

Present Illness.—The patient was first seen on October 23, 1927. A history of bronchopneumonia, from September 17 to October 10, was given. Normal temperature followed, but the fever returned. The character of the temperature was septic, reaching its apex at 8 p. m., when it was 103, and at times 104 degrees Fahrenheit. During the day his temperature ranged from 100 to 101 degrees Fahrenheit.

Physical Examination.—A decidedly toxic-looking man of about thirty-five years of age. Skin dry, brown in color. A few punched-out encrusted ulcers about 2 by 4 centimeters or approximately the size of a quarter, round or oval in shape, could be seen on the face, thorax, and one on the right leg.

The patient stated that these ulcers began as small nodules at the onset of his illness and gradually increased in size, then slowly ulcerated, discharging a

substance resembling thin pus. Later the ulcers became encrusted with a gummy necrotic scab.

The remainder of the physical examination was practically negative, except for the slight dullness on the base of the right lung and a few dry râles over both lungs. There was some sensitiveness in the upper right abdominal quadrant. Spleen was not enlarged. Pulse was weak but regular.

The character of the temperature and the toxic look suggested typhoid or paratyphoid. The Widal examination for both typhoid and paratyphoid A and B was negative. The x-ray examination of the chest was negative. Repeated blood cultures were negative. Blood count: leukocytes, 15,000. Differential blood count: leukocytes, 14 per cent; large leukocytes, 2 per cent; polymorphonuclear, 84 per cent; sputum examination, streptococci fairly numerous; pneumococci few. No other organisms identified. Urine examination was repeatedly negative.

The working diagnosis at this time was: Septicemia with possible miliary tuberculosis, although the latter was not likely, as the temperature was not of the continued type, and no cyanosis or dyspnea was present.

About November 12 there was noticed a slight bulging in the right seventh intercostal space. Aspiration was done and about three cubic centimeters of pus was withdrawn. The microscopic examination of the pus revealed no microorganisms.

A guinea-pig was injected with the purulent material. In six weeks the guinea-pig had lost sixty grams in weight. Postmortem examination of the pig showed: The peritoneum studded with small grayish-white nodules, which were of a fairly firm consistency. The liver was studded throughout with similar nodules averaging 1 to 2 millimeters in size. The spleen showed a few similar nodules. Smears from crushed nodules revealed no acid-fast bacilli. No stains or preparations were made to search for organisms resembling the yeasts.

The cavity which was discovered in the patient's chest was drained a few days later by the insertion of a catheter. Another x-ray was taken, which was practically negative except for peribronchial thickening. The patient felt improved after the drainage. The temperature dropped to 99 degrees for a few days, but the improvement was only temporary. One week later another x-ray was taken (this time with the use of lipiodol) and a large subphrenic abscess cavity extending deep into the liver was revealed. The lungs and pleural cavity were apparently not involved.

A radical drainage of the subphrenic abscess seemed advisable.

Surgical Report.—Under combined gas and local anesthesia the medial two inches of the seventh and eighth ribs were resected about the sinus. Finger exploration disclosed a sinus leading to the diaphragm. The basal layers of pleura were sutured to the parietal layer of pleura and this in turn to the upper skin margin of wound. The diaphragm was then split transversely until the sinus perforating the liver was found. Exploration of the cavity revealed an abscess within the liver about six inches in diameter. Three Penrose drains and one soft rubber tube drain were inserted, and the skin margins closed with the silk-worm gut. The wound was then irrigated several times daily with one-quarter to one-half per cent Dakin's solution.

Again there was some temporary improvement following the radical drainage of the hepatic abscess, but a few days later the same septic temperature returned. This temperature prevailed until death, which occurred about five weeks after the operation.

Fortunately the patient's family agreed to a post-mortem examination, which was performed by Doctor Kosky, who established the diagnosis of coccidioidal granuloma.

Autopsy Report.—Heart and pericardial sac are negative. Pleural cavities: Left is negative. The right

lung is similar to the left in consistency, but is limited in its basal borders by dense fibrous pleura. The right has very dense fibrous adhesions throughout. There is a walled-off sac situated immediately above the diaphragm which is about six centimeters in diameter; the wall of this sac consists of thickened pleura. On the floor of the sac is an opening into the diaphragm, one centimeter in diameter, which communicates with the superior surface of the liver.

Lungs: The left is studded throughout with firm, grayish-white nodules ranging in size from one to three millimeters in diameter. The hilar glands show anthracosis and are somewhat enlarged. Section reveals occasional whitish nodules throughout all the lobes. Smear from nodules in the lungs reveals no acid-fast bacilli.

Liver: About normal size. Scattered over the surface are occasional nodules similar to those found in the lungs. There is a healed scar on the superior surface of the liver next to the opening in the diaphragm. In the substance of the liver below this healed scar about two centimeters, is a bilobed abscess, totaling about four centimeters in diameter, containing yellowish-brown purulent material. It is quite well walled off with a membrane one millimeter in thickness. No other changes noted in the liver.

Spleen: Somewhat increased in size. There is a marked hyperplasia of the Malpighian corpuscles.

Stomach: Markedly dilated. Gastro-intestinal tract otherwise negative. Kidneys are negative. Pelvic viscera are negative.

Smear from the purulent material in the wound of chest revealed numerous spherical, refractile bodies, measuring up to 40 microns in diameter. They have a double lining membrane. Some show sporulating forms within them.

Therapy: The following general hygiene, antipyretics in form of pyramidon, sedatives, and digitol or digalen in the last four weeks, when cardiac weakness was noted. Before the hepatic abscess was discovered the working diagnosis was pyemia, or general septicemia. At that time the patient was given streptococcal immunogen (Parke, Davis & Co.) subcutaneously, and metaphen (Abbott) intravenously.

From the tomato-sauce type of the pus which drained from the liver abscess, and because the great majority of hepatic abscesses are of the amebic type, emetin hydrochlorid was given for a few days. Emetin was discontinued because of its marked cardiac depression. Saturated KI. was given for some time, but seemed to aggravate the process and it was, therefore, discontinued.

SUMMARY

This case seems of interest for the following reasons:

1. The course of the disease was rather rapid, the man being ill about four months.
2. Because in its incipency the condition was considered as a pneumonia by the attending physician.
3. Further, this case brings out the necessity for the use of lipiodol in roentgenograms of suspected abscesses.
4. It demonstrates the necessity of a biopsy of all skin lesions where a diagnosis cannot be made grossly, and further accentuates the need of repeated examinations for yeast organisms whenever pus does not show microorganisms.
5. Most of all, it brings out the need for closer coöperation between pathologist and clinician.

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An open forum for brief discussions of the workaday problems of the bedside doctor. Suggestions for subjects for discussion invited.

HEADACHE

LEROY H. BRIGGS, SAN FRANCISCO.—Headache, like many another symptom of which we know little, might logically be divided into organic and functional. The relatively infrequent organic type usually can be recognized on a proper examination and may be dismissed from this discussion by being classed roughly as follows: (1) Definite structural brain disease, as tumor, abscess, infection, vascular changes and trauma. (2) Infectious, when the headache is the initial symptom of a general infection or else is a focal manifestation, as in syphilis, tuberculosis or meningitis. (3) Disease in structures adjacent to the brain, such as glaucoma, sinusitis, or arthritis of the cervical vertebrae. (4) Nephritis, rarely arteriosclerosis, and more rarely still, blood pressure changes. Incidentally a cerebral anemia from a lowering of existent hypertension is the usual explanation of the latter. (5) With the exception of alcohol and lead, the term "toxic headaches" had better be left to the layman.

Possibly occupying a place between organic and functional, comes that most interesting headache of all, migraine. Easy of diagnosis, impossible of cure, strictly a familial disease that rarely masquerades in any other guise to deceive us, migraine presents a clean-cut clinical entity with definite time limitations for its existence. Occasionally the gastro-intestinal manifestations focus attention on that system, but a proper history will clear up the doubt. From the second decade to the sixth it harasses its victims, usually of the mental rather than the physical habitus, resisting all attempts at cure, finally subsiding just as all hope of surcease is given up. Next to its recognition, the greatest service to be rendered the patients so cursed, is to tell them the true nature of their disease, shield them from enthusiasts who promise a cure from surgery, diet or fad, and so order their lives to make them as hygienically ideal as possible.

True functional headaches constitute the great bulk of our problem, and for want of a better word might be called "neurasthenic headaches." Granting the possible lack of propriety in this term, how else are we going to class the great number of headaches seen in the asthenic and hypertonic individuals, true, often partly due to errors in bodily hygiene, worry, emotional strain, etc.? However, the fact remains that in persons of a different nervous status, similar errors and strain do not produce the headache. Eyestrain, autointoxication, constipation, "indurative headache," how often have we used these terms to the

patient with our tongue in our cheek, simply because we lacked the fortitude or tact properly to tell him the truth about himself? One hates to hear that by birth or training he is not stout enough to bear up under the buffetings of this complicated existence without some show of weakening, and he seeks out that advisor who holds forth the often vain hope of a tangible shortcut and cure, rather than the one who would show him that the sought-for relief lies in a slackening of speed, a better mode of living, or a different philosophy of life. He should be taught the words of Trudeau, that "the conquest of Fate is not by struggling against it, nor by trying to escape from it, but by acquiescence."

It behooves us, therefore, in dealing with headaches, to look on them as a symptom. Search diligently for an organic cause, and consider carefully the history, family and personal, for a possible migraine. Should finally we be satisfied in our mind of the nature of the pain, let us not delude ourselves and our patients into seeking a cure through some fad, but treat the patient himself with the headache, and not the symptom alone.

* * *

WILLIAM DOCK, SAN FRANCISCO.—The headache of organic origin is quite as difficult to explain as that which we consider as functional. Thus, secondary syphilis, without demonstrable meningeal involvement is frequently accompanied by headache, whereas this symptom is only occasionally present in central nervous system syphilis. The headache of fever and of wasting diseases, such as tuberculosis, is also functional and its incidence and severity rarely parallel any other feature of the disease. Even in brain tumor, pain may be entirely absent or occur only with fatigue, indigestion or emotional stress. Most patients with hypertension do not have headache and when it does accompany this disease it may be present only when the blood pressure is higher than the patient's usual level, as in so-called hypertensive crises, or when the pressure is at average levels or abnormally low for a given individual. Low blood pressure also occurs in many patients with migraine or habitual headache, but profound anemia, or actual vascular lesions such as cerebral softening and hemorrhage usually do not cause this symptom. I think it is safe to say that even when we are aware of the organic "cause" of headache, we do not know how the pain is produced or why this particular tuberculous, or hypertensive, or nephritic patient should have a symptom which spares most of his fellows. When organic disease exists, medication

is more rational and more successful than in its absence. Habitual headache often responds to regulated periods of rest, particularly after meals, together with moderate exercise, sensible diet and a fluid intake of over a quart and a half per day. Proper glasses, and especially amber or dark glasses when motoring, exercising or reading in bright weather probably decrease the frequency of attacks oftener than other forms of local medication, but we must gently scan our brother physicians who use more vigorous diets, drugs, surgical and psychic aids, for they do occasionally bring relief to those whom we considered unlikely to be improved by such treatment.

* * *

F. F. ABBOTT, ONTARIO.—Functional, nervous or neurasthenic headache is the diagnosis given in the largest percentage of those who consult the physician for headache. But if the physician goes no farther with his diagnosis, he is sadly neglecting his duty to his patient. Neurasthenia (whatever that may be) is perhaps an underlying cause. That is, a poor nervous heredity may make one more susceptible to headaches or any other functional nervous disorder. We cannot remedy the heredity. Our job is to make life more livable for this individual. So we must search for the exciting or contributing cause of the symptom.

A "neurasthenic" person is not able to carry a full load, and a headache is a warning of an overload. This may be fear, worry, grief, overwork, loss of sleep, sexual excesses or irregularities. Or there may be the overload of chronic foci of infection such as tonsil, tooth abscess, sinus infection, gall bladder, appendix, colon, cervix uteri, prostate, etc. Many a case of nervous headache (as of other functional nervous disorders) has been cured or markedly benefited by clearing up foci of infection.

Some of these cases are victims of an unbalanced diet—excesses in quantity of food beyond the needs of the body. Excess of foods rich in acid ash is a frequent cause of headache. With many people an excess of sweets will inaugurate a headache. I am still old-fashioned enough to believe that many headaches originate from the colon. In a person in whom imperfect digestive processes leave an abnormal amount of putrefying material in the intestine, headaches are frequent and may be relieved by a coloclyster, if this is done before vomiting has begun. The question whether headache is due to a nervous reflex or to toxins may be settled by saying it may be either one or both.

Then, there is the one whose "excess baggage" consists of poisons taken into the system; nicotine, caffeine drinks and other drugs taken in an effort to keep going. Two recent patients with nervous headaches and "nervous breakdown" have been restored to health, and are carrying a full load of life's responsibilities simply by stopping the use of tobacco and coffee. Some of these patients are victims of maladjustment to environment. For example: a young wife—torn

between two loves, for the one she married and the other she didn't. A little wise council to her and to her husband—the road to health mapped out—the headaches have disappeared.

One does not need to be a nerve specialist. The family physician can remedy a case of maladjustment through his intimate knowledge of inner family affairs. The confidence which patients (some of whom he has ushered into the world) have in him, makes for success. Let us not dismiss the patient with the diagnosis of "nervous headache" but treat the patient as a whole.

Another type of nervous headache is the neuralgic headache. Here foci of infection are especially potent causes. Look for impacted third molars; more than one case diagnosed as "Tic douloureux" has been relieved by the removal of an impacted third molar. The high frequency current applied with a vacuum electrode will give marked temporary relief.

When temporary relief can be obtained by physiotherapeutic methods, analgesic drugs should be avoided. Too many patients have wrecked their health completely by resort to headache tablets or "bromo."

Finally, always be prepared to change your diagnosis, should new symptoms arise. How often has a supposed functional headache turned out to be due to a definite organic cause or infection!

Tuberculosis "Cures" Now Rare, After Federal Action.—Drug cures for tuberculosis have become a rarity in the interstate commerce of medicinal preparations, according to officials of the Food, Drug and Insecticide Administration, United States Department of Agriculture, who are charged with the enforcement of the Federal food and drugs act.

Records of the administration show that 181 so-called "cures," "remedies," and "treatments" for tuberculosis have been proceeded against in court since the food and drugs act was made effective in 1907. Notices of judgment, numbering 358, have been issued against the 181 "cures."

So effective has been the work of the administration in removing this class of drug products from the market that today there are but few medicinal preparations for which their makers make claims of curing tuberculosis, or even mention tuberculosis in the labeling.

Several consignments of an "external tuberculosis remedy" were seized recently and court action is now pending against them. The makers of this product claim to cure tuberculosis by applying the mixture three times daily to throat, chest, back and sides.

"Tu-Ber-Ku," "Tuberculoids," "Tuberclecide," "Lunga Heala," "Lung Healer and Body Builder" are the names of only a few of the alleged tuberculosis cures which have been removed from the channels of interstate drug trade by the Food, Drug and Insecticide Administration.

Tuberculosis is almost universally present in adults as a latent infection. To keep this tuberculosis infection inactive, medical authorities advise a proper amount of work, recreation and rest, a proper amount and quality of food and fresh air. Any drugs, or combination of drugs, bearing curative claims for tuberculosis, are in violation of the Federal food and drugs act, say the officials of the administration. As such, they will be seized and legal action taken to prohibit their sale.—U. S. Dept. of Agriculture, Press Service.

California and Western Medicine

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Telephone Douglas 0062

Editors { **GEORGE H. KRESS**
 { **EMMA W. POPE**
 Associate Editor for Nevada . . . **HORACE J. BROWN**
 Associate Editor for Utah **J. U. GIESY**

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Leaflet Regarding Rules of Publication.—California and Western Medicine has prepared a leaflet explaining its rules regarding publication. This leaflet gives suggestions on the preparation of manuscripts and of illustrations. It is suggested that contributors to this journal write to its office requesting a copy of this leaflet.

ucational publicity, such as the League has been conducting for the past eleven years, is one of the most effective weapons we have in curbing preventable diseases and reducing the patronage of quackery. The practical value of scientific medicine and all allied sciences is equivalent to the amount that the public understands and will accept and practically apply. Science is far in advance of its general appreciation and application, and ignorance of and indifference to facts pertaining to individual and community hygiene, based upon the physical sciences, the biological sciences and the social sciences, are responsible for many preventable diseases, which are the greatest wasters of life and health. The great advances of science can be applied in the most effective way for the promotion of health and the reduction of preventable disease by the coöperation of all factors—the agencies of scientific medicine, the public, and an efficient central information service such as is now established by Better Health Foundation. The awakening of the public to the need of protecting their bodies and minds and to bring the messages of scientific medicine to the daily attention of the average newspaper reader is a service of great importance. Health and disease conditions are not only matters of personal importance, but they exert far-reaching influence upon the collective social and economic life of the state. Unused knowledge is useless. Continuous public health education is necessary so that practically everyone will learn what scientific medicine can do for them and how to apply its scientific lessons in making life healthier, happier and more efficient.

Eight different classes of membership are provided for by Better Health Foundation, embracing persons whose education, good judgment and practical experience in various specialized fields of health conservation and scientific research work equip them to undertake impartial studies and fact-finding surveys for the Foundation; owners, executives and administrators of institutions, corporations interested in facts pertaining to disease and accident prevention in industry, hospitals interested in hospital betterment, etc. All interested in any phase of this constructive health program will be given an opportunity to contribute small or large amounts to help carry on the beneficent work of the Foundation. All of the money raised whether from donations of philanthropists or dues of members will be devoted to constructive work as none of the directors as such receive any compensation, salary or profit in any form. Busy as these eminent men are with their manifold and diverse functions they have found time to organize and conduct this Foundation to help solve problems that endanger the health and happiness of homes, that handicap educational, civic and commercial progress, that retard the mental, physical, material and spiritual advancement of society. The high professional standing of the men who have established Better Health Foundation after eleven years of valuable experience and altruistic effort through the League may be accepted as conclusive evidence of sustained interest in a needed work and ability to perform that work well.

EDITORIALS

BETTER HEALTH FOUNDATION

California has taken another advanced step in public health promotion. Better Health Foundation, a non-profit, non-stock California corporation, is the name of a new merger which brings together forces representing many important health activities. Articles of incorporation have just been filed and the officers of the Foundation are: Dr. Reginald Knight Smith, president; Dr. Langley Porter, first vice-president; Dr. James W. Ward, second vice-president; Hartley F. Peart, executive vice-president; Dr. John Gallwey, treasurer; Dr. Charles D. McGettigan, comptroller. Directors—Drs. William Palmer Lucas, Walter F. Schaller, O. D. Hamlin, Dudley Smith, W. P. Read, Ferdinand Stabel, Harold Brunn and Celestine J. Sullivan, director of information service.

Dr. W. B. Coffey, chairman of the executive committee, aptly describes the Foundation as "a philanthropic clearing house—the first non-profit non-stock corporation organized for the health profit of the public." The corporate seal of Better Health Foundation crystallizes its mission in these words: "For the Commonwealth and Commonwealth."

The Foundation will take over Better Health Service, hospital betterment work and other activities of the League for the Conservation of Public Health and expand the constructive program of health education. Authoritative, well-directed ed-

Whole-hearted cooperation of the public is assured.

Philanthropists, in many striking instances, have given great sums of money for purposes, institutions and organizations that are no longer practical. Having in mind many frozen funds and inoperative endowments that were established for transitory needs, and that unwise bequests and endowments may create dangerous problems instead of conferring benefits on a community, the officers of Better Health Foundation will supply accurate information to philanthropists who desire to make endowments, bequests, donations or contributions to enterprises, institutions, agencies or special work of practical value in solving vital problems, so that the gift may be serviceable and not impractical, so that foresighted philanthropy may meet scientific and economic developments and keep step with ever-changing standards, customs, laws and living conditions. The basic virtue of this plan is that it establishes a disinterested and competent body to whom men with money to give may turn for impartial information.

Better Health Foundation will open up many new avenues of service and the people of California will receive lasting benefits from its program of practical idealism.

A BIRD'S-EYE SURVEY OF C. M. A. MEMBERSHIP FIGURES

What Constitutes Eligibility to County, State and National Medical Societies?—Organized medicine in principle, aims to include every eligible doctor of medicine within its fold.

An eligible practitioner is a doctor of medicine; holding his degree from an acceptable school of medicine; who is duly licensed in the state; who affirms he is a practitioner of non-sectarian medicine; and who is honorable and ethical in his relations with his colleagues and the lay public as laid down in the precepts and codes of the profession.

Possessing such qualifications, which in the new California Medical Association Constitution and By-Laws are more specifically outlined in Article IV and in Chapter I, such an eligible practitioner can be elected to membership in the component county society of the county in which he resides. He thus automatically becomes a member of the state association and also a member of the American Medical Association. Through the payment of the five dollar yearly dues of the national association, he becomes a Fellow of the American Medical Association, and receives without further cost, the weekly publication of the national organization, the *Journal of the American Medical Association*.

* * *

Important that Eligible Practitioners Should Become Members.—It is highly important, in the troublous, propagandist times which nowadays are seemingly everywhere in evidence, that the component county societies should be alert to their responsibilities concerning eligible practitioners, who, for various reasons, have not affiliated them-

selves with organized medicine. It is to be remembered that those who should be with us but who are not, are through such nonaffiliation not only apt to be not of us, but actually against us. The quiet nonaffiliation or outright nonmembership antagonism of reputable eligible practitioners nullifies the organization efforts of about the same number of practitioners who are members. In other words not to have all eligible practitioners as active members in organized medicine makes for wastage in effort, and somewhat lesser prestige and influence. Such a policy is self-evidently not a very sensible one.

* * *

Membership Figures of the California, Utah and Nevada Medical Associations.—The California, Utah and Nevada Medical Associations measure up to a fair average, when their total membership is compared to the total number of licensed doctors of medicine within their commonwealths. Nevertheless, the organization development has by no means reached its highest possible level in these three state organizations. Their officers and those of the component county societies must continue to survey their respective fields and make continued efforts to bring into affiliation all nonmembers who are eligible. This subject was discussed in the January 1928 issue of this journal, page 81, and county society officers who are interested in their responsibilities in this field of work may find therein some suggestions worthy of consideration.

* * *

Official State Examining Board Figures for California.—In the correspondence column of the June 1929 issue of CALIFORNIA AND WESTERN MEDICINE, page 453, was printed a letter from Doctor C. B. Pinkham, secretary of the California Board of Medical Examiners, wherein he gave the information that 9702 doctors of medicine have licenses to practice in California. About 1701 of these practice in other states. That leaves 8001 doctors of medicine residing in and eligible to practice in California. Of the total 9702 doctors of medicine licensed to practice in California, Doctor Pinkham in a subsequent letter stated that about 700 or 800 were homeopathic and about 400 were eclectic graduates.

From these figures it would appear that there are therefore about 8502 doctors of medicine who were graduates of nonsectarian schools of medicine. The total membership of the California Medical Association as given in the 1929 year book register was 4624, leaving about 3874 licensed doctors of medicine in California who were not members of the C. M. A. Between 2500 and 3000 of this last number of nonmembers are in active practice in the state. It must be self-evident that a goodly number of these nonmembers possess the qualifications that would make them eligible to membership in the component societies of the counties in which they reside. The best interests of organized medicine indicate that the component county societies should make surveys to determine who are the eligible practitioners among nonmember doctors of medicine.

An Analysis of Membership and Nonmembership Figures by California Counties.—In compiling the figures given below, the writer took the statistics given in the Directory of the California Medical Association of 1929, and in the Directory published by the Board of Medical Examiners of the state of California of date of March 3, 1928. An inspection of the figures showing total number of licensed practitioners in each county, total number of members and nonmembers, and the percentage of members to the total number of licensed doctors of medicine for the different county medical societies of California should be of interest and is given below:

County	Total number M. D.'s	Members	Non- members	% Mem- bership
Alameda	718	406	312	56.5
Amador	7	4	3	59
Butte	34	20	14	58.7
Calaveras	11	5	6	45.5
Colusa	5	5	0	100
Contra Costa	62	30	32	48.3
Del Norte	3	1	2	33.3
El Dorado	3	2	1	66.6
Fresno	135	103	32	76.3
Glenn	14	8	6	57
Humboldt	40	33	7	82.5
Imperial	33	22	11	33.3
Kern	67	48	19	71.6
Kings	15	8	7	53.3
Lake	10	2	8	20
Lassen	10	10	0	100
Los Angeles	3335	1684	1851	47.6
Madera	15	8	7	53.3
Marin	33	20	13	60.5
Mariposa	4	1	3	25
Mendocino	22	15	7	68
Merced	24	20	4	83.3
Mono	1	1	0	100
Monterey	49	27	22	55
Napa	41	23	18	56
Nevada	10	6	4	60
Orange	133	88	45	66
Placer	33	29	4	87
Plumas	7	4	3	57
Riverside	77	49	28	63
Sacramento	150	127	23	84
San Benito	13	7	6	53
San Bernardino	154	103	51	66
San Diego	392	223	169	56.7
San Francisco	1490	917	573	61.5
San Joaquin	105	83	22	79
San Luis Obispo	29	11	18	37.7
San Mateo	56	31	25	55.3
Santa Barbara	86	68	18	79
Santa Clara	227	143	84	62.7
Santa Cruz	50	29	21	58
Shasta	10	8	2	80
Sierra	2	1	1	50
Siskiyou	22	15	7	68
Solano	39	18	21	46
Sonoma	69	44	25	63.5
Stanislaus	57	38	19	66.6
Sutter	9	5	4	55.5
Tehama	17	11	6	64.5
Trinity	1	1	0	100
Tulare	64	41	23	64
Tuolumne	13	5	8	38.5
Ventura	40	24	16	60
Yolo	28	23	5	82
Yuba	18	14	4	77.5

There may be some minor discrepancies in the figures above given, but on the whole the table represents the approximate number and percentages of member and nonmember physicians in California counties at this time. These statistics are here presented because they may serve as a starting point and be of service to county society officers who wish to make surveys in their respective counties.

* * *

How Some of the Counties Compare, One With the Other.—It is interesting that in three counties, Mono, Trinity and Colusa, there is a 100 per cent membership, a rather surprising per cent, but not more so to many readers, than the statement that in those three California counties each

county contains only one resident doctor of medicine in the entire county! In such sparsely settled counties—and California has inherited a number of such from the days of forty-nine—it is easy to get a high percentage figure. Lassen County, however, with ten physicians, has a total of ten members in its county society, giving it also a 100 per cent rating.

For the larger counties, the total society membership and the percentage of membership in relation to licensed doctors of medicine runs somewhat as follows: *Los Angeles*, 1684 members—47.6 per cent; *San Francisco*, 917 members—61.5 per cent; *Alameda*, 406 members—56.5 per cent; *San Diego*, 223 members—56.7 per cent; *Santa Clara*, 143 members—62.7 per cent; *Sacramento*, 127 members—84 per cent, and *Fresno*, 103 members—76.3 per cent.

Of county societies having more than 100 members, Sacramento, which has the honor of being the oldest county medical society of California, leads off with an 84 per cent membership. Los Angeles, which has the largest county society in the state, has the lowest rating in the list just given, with 47.6 per cent of the licensed doctors of medicine as members.

Membership statistics are necessarily a not over interesting subject to many members, but they should be of real interest to the officers of component county medical societies, because the responsibility of bringing into the fold of organized medicine all eligible nonmembers, rests somewhat directly upon those colleagues who have been honored by the bestowal of official positions from their fellows. It is hoped that the information here given will be of aid in promoting increased effort to have each component county society measure up to its maximum capacity for service.

MEETINGS OF COUNTY SOCIETIES AND HOSPITAL STAFFS—SUGGESTION OF SUMMER OUTING MEETING

The Overplus of Hospital Staff Meetings.—The standardization of hospital movement of recent years has more than justified itself. In its train of real and supposed improvements were contained, however, some procedures and activities which time has proven to have less value for developmental progress in organized medicine than was at first thought. A few years ago, in the initial enthusiasm over staff organization as a part of the program in the standardization of hospitals, plans for general and section staff meetings were laid down in some hospitals, with such generous multiplicity of gatherings and with such detailed minuteness, that in a very short time, many staff members found most of their evenings of each month presumably allocated to such meetings. To many medical men, it seemed as if a sort of evening postgraduate course of intensive type had been instituted, which, because of the compulsory attendance rules they presumably were obligated to take. This set-up was especially true in some of the larger cities, where

busy men who had membership on the staffs of two or more hospitals, at times found themselves almost inundated in their supposed hospital staff responsibilities.

* * *

Effect of Some Hospital Staff Meetings on County Medical Society Meeting Attendance.—As one looks back at recent hospital staff organization it does not now seem strange that, with active program committees, interest in the meetings of component county medical societies under such conditions should have suffered. From the standpoint of the best interests of organized medicine, such lesser interest in the meetings of component county societies was not at all desirable. Fortunately, the inconveniences associated with compulsory attendance at hospital staff meetings have helped bring about a readjustment of viewpoints and rules, so that in many communities the problem is now being satisfactorily remedied.

As a consequence, many hospital staffs now hold meetings less frequently, or if held as often as formerly, the stringent requirement of attendance at practically every meeting is not enforced. For a time, some of the program committees of staff organizations seemed to forget that a hospital staff organization was intended to limit its program presentations at staff meetings to professional topics having to do with patients and experiences in their respective institutions. In such staff organizations the hospital programs to considerable extent lapped over into those fields of activity which had long been and which still are the legitimate domains of county medical societies.

Because county medical societies are the backbone of the whole plan of organized medicine, and because organized medicine is absolutely necessary for effective results in public health and in general professional as well as in hospital work, all activities interfering with the development of county medical units must be thoroughly investigated, so that undesirable duplication may be avoided. Happily, experience has brought about a better understanding in these matters. The members of hospital staffs are learning that too frequent meetings, or too frequent discussion of matters of nonclinical or nonhospital nature are simply time-consuming measures that neither make for better staff work, better standardization of hospitals or better organization of the medical profession. Where overenthusiastic program committees of staffs continue to offend, staff members should not hesitate to call attention to the bad end-results which are apt to accrue from such too frequent staff meetings, or from scientific programs which overlap on legitimate county medical society activities.

* * *

A Summer Outing Meeting Quite Feasible.—During some one of the summer months, when the routine monthly or bi-monthly evening scientific meetings are not held, an opportunity exists for county society and staff organizations to promote organization activities through a good fel-

lowship outing or picnic. Such an outing can be arranged for some week-end, as on a Saturday afternoon or evening, or if the rendezvous is some distance away, an all day Sunday outing may be held. In almost every locality in these western states a near-by wood or canyon, or a club, or the grounds of a private country home are accessible. To such a place the members of a society or staff could go, for an all-day outdoor picnic or get-together afternoon and supper. Service could be by informal basket if club service was not to be had. Attendance might first be tried out with members only present. Then, if desirable, an outing to which family members could be invited, might be tried.

* * *

The Outing Meeting of One Hospital Staff.—At a recent staff meeting which the writer attended, the energetic committee in charge canvassed the staff members, signing them up for different games like quoits, target shooting and so on, collecting a one dollar fee from all entrants, and then giving the total sums collected to the members who won firsts and seconds in each group of games. At that particular outing, staff members in Oakland arose and in groups breakfasted with one another at different homes as early as 6 a. m., because the outing rendezvous was some two hours or more motor trip away, in an adjacent county. This particular hospital staff has held these outings once yearly during the last several years, the hospital cooperating by sending its chef and other help, to make certain that a good out-of-door luncheon would be served. Other entertainment features, such as baseball, cards and so on were provided. At the luncheon several informal speeches were made; and on this particular occasion, the host of the day at whose ranch these outings had been held yearly, was presented with a flagstaff and flag, to adorn the entrance to his ranch homestead. The attendance at this staff meeting was almost one hundred, practically all of these busy physicians giving up the best part of this particular Sunday, to relax and be boys and to become better acquainted with one another.

* * *

Physicians Should Know How to Play as Well as How to Work.—Physicians need just these kinds of contacts from time to time. Their professional lives ordinarily are altogether too isolated and individualistic. That is why so many members of the profession fail to appreciate the human and good qualities of colleagues whom they only occasionally meet, or whom they know only by reputation. Physicians, who are called upon to order the regimen of living of patients, may well take stock of their own recreational needs. The very seriousness of the work which physicians are called upon to do in the practice of medicine only emphasizes the need of occasional relaxation. And it may be said of those who take their profession in overserious fashion that their professional work and achievements are often not much better than those who know how to relax and play at the proper time.

Why Not Have an Outing This Year?—It is hoped county society presidents and hospital staff chairmen will recognize the benefits to be derived from a summer outing meeting. Such an outing can be easily brought into being if the president, secretary and one or two other interested members will act as the outing committee to make the arrangements and take charge of the details. If members who read these lines belong to county societies or hospital staffs in which a summer outing and get-together meeting has never been tried, it is hoped they will feel free to broach the desirability of such an outing to the president or chairman of their organizations. We may not live to eat, but physicians certainly are entitled to some of the joy as well as the labor of living. Meeting one another in informal social fashion makes for better personal and professional understanding and so promotes the interests of organized medicine.

DO YOU SAVE YOUR JOURNALS?

The Scope of California and Western Medicine.—CALIFORNIA AND WESTERN MEDICINE, the official journal of the California Medical Association, and the accredited publication representative of the Utah and Nevada Medical Associations, prints most of the papers which are read at the annual sessions of these three state medical organizations. Through such publication the members of these state societies have an opportunity to contact with the viewpoints of the colleagues who, through their papers at the annual sessions of these organizations, aim to bring to the attention of their fellows the latest knowledge on matters of medical science and practice.

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Current Volumes of CALIFORNIA AND WESTERN MEDICINE Should Be Filed.—Which suggests the thought that members would do well to make room on their library shelves for the issues of at least the current and the preceding year, so that references and resurveys of the contents would be more convenient. The present binding of CALIFORNIA AND WESTERN MEDICINE permits this to be easily done, for each issue has the inclusive pages printed on its back edge, the June and December numbers being also inscribed with the word "Index." The issues of the two volumes of each year take only a small space on book shelves, when placed one on top of the other, with the index volume uppermost. Years ago the writer made this suggestion of printing the page numbers on the back edge of the *Journal of the American Medical Association*, to Editor George H. Simmons, who adopted it for that journal, thus making that splendid publication easier of reference to many readers who did not wish to go to the expense of binding the somewhat bulky fifty-two issues of each year.

It is believed that the readers of CALIFORNIA AND WESTERN MEDICINE will agree that its pages contain many articles which are worthy of perusal and thought. Keeping the current files for reference is therefore justified. If your office

library is crowded for shelf room, a board can be placed in garage or attic, where the outgoing volumes may bide a bit longer before being consigned to destruction. The official journal of a state medical association, containing as it does a summary of the scientific activities of the colleagues of the commonwealth, and of the efforts that make for the upbuilding of the guild of the healing art and the protection and advancement of the professional interests of its members, is certainly worthy of better treatment than that usually given to current lay literature publications.

If there be those among us who contend to the contrary, it is hoped such colleagues will present papers at future annual sessions which will be of such superior merit that other essayists will be inspired to measure up to the same high standards. Through such participation, essayists, members at large, and our official journal would all be benefited.

HAVE YOU SENT IN YOUR BALLOT ON INCORPORATION?

It Is Important That Ballots Be Sent In.—In July the referendum ballot on incorporation of the California Medical Association was sent to each member of the California Medical Association. In this column in last month's issue, the history of this referendum was outlined. The reasons which led the councilors and officers of the California Medical Association, after several years of discussion, to favor the plan proposed were briefly indicated. A large number of members have sent in their ballots. It is important that as large a vote as possible be secured.

At the recent San Diego annual session the House of Delegates without a single dissenting vote went on record as in favor of the plan of incorporation which was submitted. The Council of the California Medical Association has done likewise.

The plan to incorporate came into being in order to provide ways and means for a greater development of the California Medical Association. The method decided upon was most carefully and deliberately considered. Snap judgment has not been in evidence. No member of the California Medical Association will be under obligations, other than those which exist under the present form of government. The general set-up of the state association will not be altered.

If this incorporation plan is ratified, it will make possible a sounder and broader scope of activities than are apt to come into existence under a nonincorporated system. In other words, the highest and best interests of the California Medical Association and of its members will be conserved and accentuated through such incorporation. It is hoped that members who as yet have not sent in their ballots will do so at an early day. Until a decision is reached by the membership, the Council will naturally wish to postpone definite action on matters of importance to organized medicine. Therefore, if you have not yet sent in your ballot, it is urged that you do so after reading these lines.

MEDICINE TODAY

Current comment on medical progress, discussion of selected topics from recent books or periodic literature, by contributing members. Every member of the California Medical Association is invited to submit discussion suitable for publication in this department. No discussion should be over five hundred words in length.

Bacteriology

Secondary Autointoxication.—To determine the possible etiology of pernicious anemia attention has been directed during recent years to gastro-intestinal intoxication with *B. welchii*. What is apparently a new toxic agent from this microorganism has just been described by Torrey and Kahn, of Cornell University Medical College, New York City.*

These investigators found that *B. welchii* filtrates injected intravenously into rabbits produces a slight transient anemia followed by complete recovery. A fraction of the same dose, however, injected into the marrow of one bone is followed by prompt degenerative changes in all bone marrows of the body, with a resulting chronic, persistent, often fatal anemia.

It is evident that this severe, systemic bone marrow degeneration is not due to a direct action of the bacterial filtrate, otherwise even greater degenerations would follow massive or repeated intravenous injections. We are here apparently dealing with some form of secondary intoxication arising from the locally injured bone marrow. The observation is of particular interest since it clearly shows for the first time the possibility of a much more complex mechanism of bacterial action than that currently assumed by clinicians.

• W. H. MANWARING, Stanford University.

Medicine

Tumors of the Pituitary Body.—Our knowledge of the functions and dysfunctions of the group of glandular structures forming the endocrine system has been gained for the most part during the present generation. Considered a few decades ago to be useless vestigial remains, we now know that they form an integral and vital part of the human economy. Of the group, the pituitary body has occupied a very prominent place in the interest of both laboratory and clinical workers. The action of the extract of its posterior lobe is common knowledge which is made use of by the physician in the treatment of conditions met with in daily practice. The relation of pituitary dysfunction to new growths developing within its tissues is not so clearly understood and many of them are overlooked. Cushing states that acromegaly, a fairly common manifestation of pituitary disturbance, is practically always due to an adenoma of the gland.

* Torrey, J. C., and Kahn, M. C., The Progressive Anemia Following a Single Intramarrow Injection of *B. Welchii* Toxins. *Am. J. Path.*, vol. v, p. 117 (March) 1929.

That tumor formations are among the more common lesions of the pituitary is now recognized by all familiar with its pathology.

Pituitary tumors may give rise to three groups of symptoms, (1) those due to disturbance of the functions of the adjacent structures, (2) those due to an increase or decrease of glandular activity, and finally (3) those due to the influence of pituitary dysfunction on the other glands of the endocrine group. Those of the first group, while not always properly interpreted, usually demand consideration, especially when the visual pathway becomes involved. In the study of the symptoms due to abnormal secretory activity, an understanding of the normal function of the gland is essential. The pituitary is composed of a well-defined anterior and posterior lobe with an interposed pars intermedia. The posterior lobe, formed by an evagination of the encephalon, is probably never the seat of a primary new growth. The anterior lobe, derived from an epithelial expansion of the foregut, is a fairly common situation for adenomatous formations. The pars anterior is composed of two essential types of cells, the *chromophile* or granule-containing and the *chromophobe* or non-granular elements. The chromophile cells contain either *eosinophile* or *basophil* granules, as shown by their reaction to acid or basic dyes. Adenomas are composed of either chromophobe or chromophile cells of the eosinophile type or, in a few instances of a mixture of both. Tumors composed of basophilic cells probably never become large enough to produce symptoms and may be disregarded from a clinical standpoint.

Symptoms of *hyperfunction* of the pituitary, as typically seen in *acromegaly* and *gigantism* are the result of excessive secretion of the constituent cells of the *chromophile adenoma*. Those indicative of *hypofunction* are the result of a pressure atrophy of the normal glandular tissue by a growing tumor whose cells have no active secretory product of their own, such as the *chromophobe adenoma* or the congenital *cranio-pharyngeal pouch cyst*.

The third group of symptoms is due to the influence of the increased or decreased activity of the pituitary upon the other endocrine glands. It will be remembered in this connection that the active principle of the anterior lobe serves normally as a stimulant to the thyroid and as a depressant of the adrenals and gonads. With this relationship in mind one is less apt to misinterpret the various manifestations of pituitary dysfunction incident to new growths arising within its tissues. A possible error of this type is the

incorrect evaluation of the obvious symptoms of hyperthyroidism in mild cases of acromegaly whose minor bony and soft tissue changes have been overlooked.

CYRIL B. COURVILLE,
College of Medical Evangelists.

Radiology

Opaque Media in Diagnosis of Maxillary Sinusitis.—Maxillary sinusitis is one of the most common pathological conditions, yet continues to be treated often by the so-called "trial and error method." In not less than half the cases it may sooner or later be associated with infection of ethmoid, sphenoid and frontal sinuses. In the study of maxillary sinusitis by roentgen-ray methods after injection of same by opaque media such as iodized oils, we have an excellent method of determining the type of treatment to be followed. The American-made iodized rape-seed oil (campidol) is probably more useful than the foreign-made lipiodol and iodipin, which are not so easily diluted. Some of the neglect to study these cases by opaque media is traceable to the roentgenologist who believes he can diagnose all cases of polyps and thickened membranes without the use of such media. I believe it is fair to state that even in the most experienced hands, not over 40 per cent can be so diagnosed. Repeatedly we see cases that have had the benefit of this expert opinion and the only x-ray diagnosis is an even cloudiness of antrum on the x-ray film. This finding is sometimes paralleled by an increase in density on transillumination, but not always. Patient has usually been under treatment from six months to a year by several specialists, there is no discernible discharge from the nose, washings from the antrum are negative, yet patient has a small amount of clear discharge from nose at times, takes cold easily, wheezes, has headaches, dizziness, nausea, etc., and possibly a history of nasal polyps, bronchiectasis or toxemic states. When these antrums are injected with opaque media and then x-rayed the lining membrane is shown to be 4 to 8 mm. in thickness. It is therefore clear that any other treatment than the radical Caldwell-Luc operation will not get results. Often polyps are shown in this way that appeared as an even cloudiness on the x-ray film by the best x-ray technique. This is usually true of multiple polyps in the antrum. Some rhinologists apparently lose interest or make a diagnosis of nonsuppurating hyperplastic membrane, yet when these are operated on, the pathologic findings are certainly good evidence that they can give rise to neuritis, etc., as much as an abscessed tooth can do so. The changes of the thickened membrane in the antrums are usually those of inflammatory edema of the mucosa and submucosa, often infiltrated with lymphocytes. Surface at times shows irregular erosion; these latter cases as a rule have less evidence of edema than the others and are not quite so thick. The amount of vascularity varies, thin-walled vessels occur quite often. It seems reasonable that absorption from this membrane is easily possible, even if the

surface washings are negative for presence of pus. Certain it is that the membrane is not normal and should not be neglected surgically. Also certain is it that x-ray examination after an opaque medium is injected will indicate when radical operation is advisable and will prevent much of the economic loss otherwise apt to come to the unfortunate patient afflicted with chronic hyperplastic maxillary sinusitis.

HENRY SNURE, Los Angeles.

Beware of So-Called "Health Foods," Say U. S. Food Law Officials.—The American public should beware of "health foods," "life grains," and other food products for which makers claim curative or health-giving properties, say officials of the Food, Drug and Insecticide Administration, United States Department of Agriculture.

The administration believes the use of the word "health" in connection with foods constitutes a misbranding under the food and drugs act. "The use of this word implies," says W. G. Campbell, chief of the administration, "that these products have health-giving or curative properties, when, in general, they merely possess some of the nutritive qualities to be expected in any wholesome food product."

"The label claims on these products," he says, "are such that the consumer is led to believe that our ordinary diet is sorely deficient in such vital substances as vitamins and minerals, and that these so-called 'health foods' are absolutely necessary to conserve life and health."

"In the enforcement of the food and drugs act, it is necessary to warn manufacturers of these products to have their labels conform to the facts of medical science and actual laboratory tests. The Food, Drug and Insecticide Administration does not object to calling these products 'wholesome,' provided they are wholesome, but the effort to give the impression that we all need something added to our everyday diet if we are to avoid nutritional disaster is a misrepresentation which the food-law enforcing authorities aim to combat."

"So-called 'health-giving' biscuits, foods, and waters are not only a waste of money if purchased for their curative properties but are responsible for a more serious loss because their use is relied upon as a substitute for appropriate corrective measures, such as a proper diet, exercise and sunshine."—U. S. Dept. of Agriculture, Press Service.

Mental Hygiene.—First International Congress on Mental Hygiene will be held at Washington, D. C., May 5-10, 1930. The Congress is sponsored by mental hygiene and related organizations in more than twenty-six countries.

Progress is being made in the organization of the First International Congress on Mental Hygiene, to be held in Washington, D. C., May 5-10, 1930. Educators, psychiatrists, other physicians, public officials, social workers, industrialists and many others from all over the world are expected to be present when the Congress convenes.

Herbert C. Hoover has honored the Congress by accepting the position of honorary president. Already twenty-six countries are represented on the committee on organization, of which Dr. Arthur H. Ruggles, of Providence, R. I., is chairman. Dr. William A. White, of Washington, D. C., is president of the Congress, and Clifford W. Beers is secretary-general.

Questions to be discussed at the Congress will include the relations of mental hygiene to law, to hospitals, to education, industry, social work, delinquency, parenthood and community problems. A world-wide view of mental hygiene progress will be given. Administrative headquarters have been opened at 370 Seventh Avenue, New York City, where John R. Shillady, administrative secretary, is in charge.

STATE MEDICAL ASSOCIATIONS

CALIFORNIA MEDICAL ASSOCIATION

MORTON R. GIBBONS.....President
 LYLE C. KINNEY.....President-Elect
 EMMA W. POPE.....Secretary

COUNCIL MINUTES

Minutes of the One Hundred and Eightieth Meeting of the Council of the California Medical Association

Approved at the One Hundred and Eighty-Second Meeting of the Council

Held in the offices of the Association, 1016 Balboa Building, San Francisco, Saturday, March 16, 1929, at 10:30 a. m.

Present.—Doctors Kiger, Gibbons, Hamlin, Kelly, Kinney, Duffield, DeLappe, Coffey, Harris, Rogers, Peers, Catton, Kress, Pope and General Counsel Peart.

Absent.—Doctors Pallette, Bingaman, Shephard, Curtiss and Shoemaker.

1. **Roll Call.**—The meeting was called to order by the chairman, Oliver D. Hamlin.

2. **Income Tax Reduction.**—An informal discussion was had on the present campaign being carried on through the Hearst newspapers for decrease of the federal tax on earned incomes.

Action by the Council: On motion of Kress, seconded by Kiger, it was

Resolved, That the Council of the California Medical Association go on record as being in hearty sympathy with the campaign and further that Doctor Kelly draft a resolution on behalf of the Council giving the Council's attitude, and that this resolution be given such publicity as under the premises may add to the force of the resolution.

The secretary was empowered to send a copy of the resolution when drafted to every county unit of the Society and request that they give the matter publicity by passing a somewhat similar resolution and forwarding copy to this office.

3. **Senate Bill 182—Narcotics.**—Senate Bill 182 on Narcotics, sponsored by Senator Sanborn Young, was discussed fully. Doctor Harris stated that he had discussed this bill with Senator Young and that he had been informed that the word "administer" had been deleted from the bill and that the twenty-four-hour notification period had been changed to five days. It was pointed out that the bill dictated the practice of medicine in that it specified a limit on the time of treatment and amount of narcotic allowed an addict under treatment; also that under the provisions of the bill it would be necessary to report a large percentage of all patients treated for other afflictions besides drug addiction.

Action by the Council.—On motion of Kress, seconded by Duffield, it was

Resolved, That the Council of the California Medical Association go on record as violently opposed to Senate Bill 182; first, it is a violation of the personal relationship between the patient and the physician; second, it is impractical, and the provision regarding the punishment of a misdemeanor by fine and jail sentence is little less than an insult to the medical pro-

fession; and further, that a Committee of Three consisting of Doctors Catton, Harris and Duffield be instructed to draft a letter to show the extreme unreasonableness of the bill in regard to percentage of patients that will have to be reported; copy of this letter with copy of Bill 182, if possible, to be sent to every county unit with instructions to defeat this measure as the Council is unalterably opposed to it.

The chairman of the Legislative Committee was named as an ex-officio member of the committee.

It was stated that the increase in cost of medical care might well be stressed in the letter prepared.

4. **Vocational Standards Bill.**—The secretary read a telegram which had been sent to Doctor Shoemaker after the receipt of his telephone call stating that he was preparing to mail a circular letter opposing the Vocational Standards Bill.

Doctor T. Henshaw Kelly, chairman of the Committee on the Vocational Standards Bill, reported step by step on the action taken by the Council and Executive Committee on the Vocational Standards Bill. It was pointed out that both the Council and Executive Committee action indicated that if the bill was amended to include the suggestions of the medical profession, the California Medical Association would not oppose it. Doctor Kelly stated that at the last meeting of the Executive Committee a committee consisting of Doctors Gibbons, Shoemaker, Harris and himself and Mr. Peart as attorney, was appointed to confer with Mr. Heron, and that immediately after the executive meeting he had gotten in touch with Doctor Harris and asked him to arrange a time for the conference. Doctor Kelly stated that on Friday he was advised that Doctor Pope had received a telephone message from Doctor Shoemaker stating that he was sending out a letter opposing the Vocational Standards Bill. Doctor Kelly immediately sent the wire to Doctor Shoemaker asking him to withhold action. At a later conference at Sacramento Doctors Kelly, Gibbons and Harris had discussed the bill and all suggestions of the California Medical Association were incorporated with the exception of two minor suggestions of Mr. Peart which Mr. Heron stated were already covered by other language in the bill. Doctor Shoemaker was unable to attend the Sacramento conference. Discussion was then had of the two points brought out by Mr. Peart; namely, reclassification of Division No. 1 in section 376b, and the provision for retaining all functions and duties which are now or may hereafter be given the Boards in Division No. 1 in section 376n.

After discussion, on motion of Kress, seconded by Harris, it was

Resolved, That the Committee on the Vocational Standards Bill try to incorporate these two suggestions, if possible to do so.

Doctor Duffield then explained the opposition to the bill throughout the South.

It was felt that a fair conception of the bill could only be had after a thorough study and that some of the antagonism might be due to a failure to understand the more intricate points of the bill.

It was the sense of the Council that with one or two minor changes which should be made if possible, the bill was in the shape the Council wanted and that no opposition should therefore be given it.

Discussion was then had regarding the value to the California Medical Association of an official observer at the Assembly who represented other interests in addition to those of the Association.

At this point Doctor Coffey stated that he wished to be relieved of the responsibility of signing vouchers for the Legislative Committee.

Doctor Gibbons commended Doctor Harris on the constructive work done at Sacramento and stated that he felt no other observer was necessary as Doctor Harris was capable of caring for the best interests of the medical profession.

Action by the Council.—On motion of Kress, seconded by Gibbons, it was

Resolved, That a committee consisting of the president of the Association, Doctor Catton, Doctor Harris and Doctor Kelly be empowered to confer with Doctor Shoemaker and discuss the situation.

After further discussion, on motion of Kress, duly made and seconded, it was unanimously

Resolved, That a committee be appointed by the chairman of the Council to draft a letter to be sent to the members of the California Medical Association at the earliest possible moment, telling them the history of the Professional and Vocational Standards Bill and the various actions of the Council, Executive Committee and Legislative Committee leading up to the present amended form of the bill and explaining the reasons why the Council feels that the best solution of the matter now is not to oppose the bill.

The chairman of the Council appointed a Committee of Four consisting of Doctors Harris, Catton, Shoemaker and Kelly.

It was pointed out that the medical profession had always been opposed to lobbyists at Sacramento and that the best interests of public health and medicine could only be served by intelligent discussion and support of the ideals of the medical profession. Also that final authority in all things should always be with the Council or the Executive Committee when the Council is not in session.

Action by the Council.—On motion of Duffield, duly seconded, it was

Resolved, That the Council proceed with the next order of business.

5. **Senate Bill 217—Revocation of Licenses.**—It was pointed out that this bill provided that conviction or cash compromise of a charge of violation of the Harrison Narcotic Act constitutes sufficient evidence for citation before the Board of Medical Examiners. The bill also contained other provisions for revocation of certificates.

Action by the Council.—On motion of Kress, seconded by Kelly, it was

Resolved, That Senate Bill 217 be referred to a committee consisting of Doctors Catton, Duffield and Harris for study and report to the Committee of Three consisting of Doctors Gibbons, Kelly and Mr. Peart.

Doctors Duffield, Catton and Harris were to meet with Senator Sanborn Young and discuss the narcotic situation.

6. **S. B. 258—Cosmetology Bill.**—The secretary stated that Dr. Pinkham felt that following the word "appliances," page 2, line 1, the bill should be amended to except high frequency and x-ray machines; and that after the word "practice," line 17, page 2, should be inserted the words "providing that no provision herein shall in any way conflict with any provision of the Medical Practice Act."

7. **Nurses Bill.**—Senate Bills 52, 104 and 143 were presented. After discussion, on motion duly made and seconded, it was

Resolved, That Doctor Harris inform Senator Crowley that these bills are most inopportune at this time.

8. **Jamaica Ginger—S. B. 545.**—Senate Bill 545, Jamaica ginger, was referred to the Committee of Three consisting of Doctors Gibbons and Kelly, and Mr. Peart.

9. **Medical Service Corporations—A. B. 16.**—The secretary presented correspondence from Doctor Shoemaker regarding the Medical Service Corporation and stated that Doctor Shoemaker felt that the passage of A. B. 16 might make these proceedings very complicated.

Action by the Council.—On motion of Coffey, seconded by Duffield, it was

Resolved, That Assembly Bill 16, Bureau of Medical and Hospital Service, be opposed.

10. **Mental Health Boards—A. B. 309.**—It was the consensus of opinion that this was an undesirable bill.

11. **Department of Institutions.**—Action by the Council.—On motion of Kress, duly seconded, it was

Resolved, That S. B. 310 be referred to a committee consisting of Doctors Harris, Catton and Duffield for study and report to the Committee of Three consisting of Doctors Gibbons and Kelly, and Mr. Peart, which Committee of Three shall have power to act.

12. **S. B. 174—Vagrants.**—Senate Bill 174 relating to vagrants was referred to the Committee of Three. It was felt that page 2, line 11, "has lost the power of self-control with reference to his addiction" should be amended to include words to the effect "so as to be a danger to the public morals or health of others."

13. **Constitution and By-Laws.**—Doctor Kiger inquired as to whether the Constitution and By-Laws had been sent to all county societies, as he had received several inquiries regarding them in the South. The secretary informed Doctor Kiger that they had been mailed to all county societies and presented copies to councilors desiring same.

14. **Adjournment.**—There being no further business, the meeting adjourned.

OLIVER D. HAMLIN, *Chairman.*
EMMA W. POPE, *Secretary.*

COMPONENT COUNTY SOCIETIES

ALAMEDA COUNTY

The last meeting of the Alameda County Medical Association before its annual vacation was held at the regular meeting room, Ethel Moore Memorial Building, on Monday, June 17, at 8:15 p. m.

The first paper of the scientific program was by Dr. E. D. Moffett on a new disease in society. Dr. Moffett's paper was a discussion of the topic of Birth Control, in which the doctor condemned the entire movement.

The second paper of the evening was a report of a case of vagitus uterinus by Dr. Lindsay Peters. Following an attempt to apply forceps for delivery, air was sucked into the uterus in sufficient quantities to allow the infant to breathe and to cry repeatedly *in utero*. Twenty minutes later the child was delivered in a partially asphyxiated condition, but was resuscitated by artificial respiration. Dr. Kelsey reported having had a similar experience.

The third paper of the evening was a report of a case of carcinoma of the rectum in a fourteen-year-old boy, who had a history of trauma immediately preceding symptoms. This case is the twenty-second case of its kind reported in medical literature in individuals under fifteen years of age.

GERTRUDE MOORE, *Secretary.*

PLACER COUNTY

The Placer County Medical Society met in Auburn Saturday evening, June 15, 1929, with Dr. Max Dunievitz presiding.

There were present the following members and visitors: Members—Drs. Rooney, Thoren, L. B. Barnes, Paul Barnes, Russell, Dunievitz, Durand, Peers, Miller, Fay, Eveleth, Conrad Briner, Monica Stoy Briner and Lewis. Visitors—Dr. Gorley, of Weimar; Dr. Rowe, Oakland; Drs. Gundrum, Harris, Fanning and Haig, Sacramento, and Dr. McGibbon, of Canada.

A letter from Dr. Fred J. Conzelmann, secretary of the San Joaquin Medical Society, reported that Dr. Thomas C. O'Connor, Jr., had been elected to membership by transfer from the Placer County Medical Society to the San Joaquin Medical Society.

The president appointed Dr. Monica Stoy Briner, of Lincoln, and Dr. Mildred E. Thoren, of Weimar, as a committee to cooperate with Mrs. H. S. Rogers, president of the Woman's Auxiliary of the California Medical Society.

The secretary gave a report of the fifty-eighth annual meeting of the California Medical Association at Coronado.

Following the routine business, Dr. Junius B. Harris, Councilor of the Eighth District, addressed the society. This being Dr. Harris' official visit, he reviewed the work of the Council and of the state society during the past year, giving particular attention to a résumé of the work of the legislative committee during the meeting of the recent Legislature.

Dr. Harris also dwelt at some length on the changes in the Constitution and By-Laws, and also on the proposal to establish Councilor District Medical Societies.

At the conclusion of his remarks a vote of thanks and confidence was tendered Dr. Harris for the able manner in which he has represented the Eighth District.

Dr. Albert H. Rowe, of Oakland, a guest of the evening, then gave a most able presentation of the present knowledge of allergy. Dr. Rowe said, in part:

"Allergy is being recognized as a common cause of symptoms in about 25 per cent of the population. Its manifestations occur especially in the skin, the naso-bronchial tract, the gastro-intestinal tract, in the nervous tissue, and, to a lesser extent, in the uro-genital tract. As causes of hay fever, asthma and eczema, foods, pollens, animal emanations, house dusts, occupational dusts, certain drugs, and miscellaneous substances, such as orris root and pyrethrum, must be considered. As a cause of urticaria, angioneurotic edema and migraine, certain types of neuralgia, certain gastro-intestinal disturbances and the so-called bladder allergy, food sensitization is commonly at fault. In fact, food allergy occurs more often in children, and especially in adults, than has been appreciated and is infrequently associated with positive skin reactions. For the diagnosis of such food allergy, the history of food idiosyncrasies, the presence of a personal or family history of an allergic condition and the presence of positive skin reactions are of importance. The use of my elimination diets has been found to be of great value in both the diagnosis and the treatment of the various manifestations of food allergy."

Dr. Gundrum, of Sacramento, opened the discussion in his usual able and interesting manner. The paper was further discussed by Drs. J. B. Harris, William M. Miller, Max Dunievitz and Robert A. Peers.

No further business appearing the meeting adjourned.

ROBERT A. PEERS, *Secretary.*

SACRAMENTO COUNTY

The regular monthly meeting of the Sacramento Society for Medical Improvement was held at the Senator Hotel on June 18 and called to order by President Pope at 8:40 p. m.

The minutes of the previous meeting were read and approved.

Dr. Hall reported a case of rabies in a dog which bit two children. The head of the dog was sent to the University of California laboratory and a report was positive for rabies. The children now are under treatment.

The paper of the evening, "Facts and Fallacies of the Wassermann Test," was given by Dr. Fanning.

Dr. Fanning stated that since the Wassermann test was originated in 1906 many workers and investigators had published numerous modifications and improvements, and that today few or none are performed exactly as was the original. The most important that has stood the test of time is Kolmer's modification.

In 1921 Kolmer studied all tests thoroughly and without bias, and after much effort incorporated the facts into a new test, embracing a new antigen and technical improvements, and so today this test excels all other tests in sensitivity and specificity.

Many serologists and technicians object to the Kolmer method because of the added time needed in the performance and interpretation of the test and the delay from the sixteen to eighteen hours' ice-box fixation, so many use Kolmer's cholesterinized beefheart antigen only, devising their own modifications. The men who do this should not be criticized too severely because in many instances it may be due to incompetent laboratories or technicians. Likewise the physicians rush the laboratories too much and demand a report the same day the blood is sent in. They do not allow the laboratories sufficient time.

Specificity.—The Wassermann test today is not biologically specific, for we use an antigen of cholesterinized beefheart instead of luetic extracts. It has been definitely proven that not only the lipoids are necessary for the antigen antibody reaction. The Kolmer test gives only a true positive reaction in syphilis and yaws.

The acute exanthemata and many other conditions give a positive reaction with the older methods, but can now be ruled out as not being luetic.

Certain conditions at times may interfere with the Kolmer test. Some of these are jaundice, postmortem serum badly hemolyzed, and placental cord blood.

The greatest error in all tests is the false negative. The strength of the test depends on the degree of spirochetal activity and the liberation of "reagin." In negative cases oftentimes the tests are not sensitive enough to pick up small amounts of reagin.

In some cases, especially those with involvement of the brain and cord, the Wassermann reaction may be negative and the spinal fluid positive. In old cases, and those presenting evidence of involvement clinically, a negative blood reaction possesses little or no value in excluding lues. This occurs also in treated cases and a spinal fluid examination must be performed before conclusions can be drawn on the serological cure of lues.

A positive Wassermann is not always an indication that a particular lesion is luetic. Patients may have lues and any other disease, for lues grants no immunity to infections or pathological processes, but rather predisposes to other diseases.

The Wassermann test is the most delicate and constant of the single sign of lues, usually the last to disappear and the first to reappear if a complete cure has not been effected. In treated cases a single negative is no evidence of a cure, for after treatment is discarded the Wassermann test may reappear positive,

followed by clinical relapses. It is necessary to make successive examinations for two years at least, and occasionally at set intervals the remainder of the patient's life.

In closing Dr. Fanning stated that no valuable diagnostic test has received so much exultant praise or so much unworthy criticism as the Wassermann reaction, and that the Kolmer modification is an exact affair, worked out to the most minute details, and it should be followed to the letter, or the results will not meet expectations, and unless followed, the variations should not be laid at the door of Kolmer's test.

The paper was ably discussed by Drs. Christman, Harris, Schoff, Gundrum, Beach, Scatena and Wilder.

The applications for membership from Drs. Pollock and Barrette were read and voted upon. Both were elected to membership.

A letter from the nurses was read. This was in regard to a ten instead of a twelve-hour day. A higher fee was asked if a twelve-hour day was necessary. This was discussed, and it was then moved and seconded that this matter be laid on the table. Motion carried.

Report of committees.—Dr. Lindsay being absent there was no report in regard to the delegates of the State Convention.

Dr. Harris reported on matters taken up at the Council. The principal matter taken up was that of a new constitution and by-laws. Dr. Harris also stated that the state was to be divided into nine councilor districts and that there were to be eighteen counties in the northern district.

There being no further business the meeting adjourned.

H. SCHLUTER, *Secretary*.

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SAN BERNARDINO COUNTY

Minutes of the regular meeting of the San Bernardino County Medical Society held at the Redlands Community Hospital on May 21, 1929:

The meeting began with inspection of the hospital at 7 p. m.

Meeting was called to order by the president at 8:15.

The minutes of the previous meeting were read, and, after correction, were approved.

Communications from the California Tuberculosis Association and University of California regarding summer courses for graduates were read.

The following were elected to membership: Drs. C. A. McDowell, H. W. Seiger and Alma Goude.

The program consisted of two papers: 1. "Cardio-Renal-Vascular Disease; 2. "Ureteral Anastomosis."

Owing to the length of the program the papers were not thrown open to general discussion.

The meeting closed at 9:30, following which refreshments were served by the Cloverleaf Club of Redlands and a second inspection of the hospital followed.

E. J. EYTINGE, *Secretary*.

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SAN DIEGO COUNTY

The San Diego County Medical Society and affiliated scientific bodies hold no meetings throughout July and August, nor do the medical staffs of the various hospitals place any scientific programs during this period.

A good number of our local members attended the American Medical Association in Portland, taking advantage of the comparative nearness of that great meeting.

The June meeting of the society, the last one before the summer recess, featured an excellent entertainment by our local men, Drs. T. O. Burger, C. J.

Osborne and H. G. Holder, in the form of a 35-mm. three-reel moving picture illustrating the modern method of treating varicose veins by the injection of sclerosing solutions. The pictures showed graphically the anatomical structure relating to the venous system of the lower extremities. Animated pictures showed the circulation in normal veins and those varicose or without proper valve control. Various tests were shown illustrating the incompetency of valves on the saphenous and intercommunicating veins. The technique of the injection treatment was graphically portrayed from a living subject, while the text on the screen discussed the solutions used and the indications for their selections. So large a series of cases were reported and with such signal success as to place this injection treatment in an established position in the surgery of today.

The summer session of the San Diego Teachers' College, now in session under Dean Willis Johnson, includes public health talks every day during the week of July 7 to 12 inclusive. Among the speakers on this program we note the names of Dr. Kofoid of California University; Dr. Lokrantz, of Los Angeles; Dr. Aurelia Reinhardt, president of Mills College, Oakland, and Dr. William H. Barrow, of San Diego. This course of health talks open to the public was endorsed by the Council of the San Diego County Medical Society.

ROBERT POLLOCK.

CHANGES IN MEMBERSHIP

New Members

Humboldt County—Harold Galen Leland.
Imperial County—W. E. Hart.
Mendocino County—Charles E. Sisson.
Napa County—Clarence E. Nelson.
Orange County—Paul H. Esslinger, M. K. Tadmstrom, J. A. Wood.
Sacramento County—John H. Miyasaki.
San Francisco County—Abraham Bernstein, Enea A. Guis, Kozo Tamaki, Mast Wolfson.
Ventura County—Douglas W. Ritchie, Rudolph Patton.

Transferred Members

Thomas C. O'Connor, Jr., from Placer to San Joaquin County.
Carl G. Williams, from San Bernardino to Los Angeles County.
Ethel H. Williams, from San Bernardino to Los Angeles County.

Resignations

Harry B. Reynolds, Santa Clara County.
Elsie Reed Mitchell, Alameda County.
Oscar Mohs, Alameda County.
Fred W. Morse, Alameda County.

Deaths

Ainsworth, Frank Kenley. Died at San Francisco, July 5, 1929, age 79. Graduate of the University of Vermont College of Medicine, Burlington, 1878, and New York University Medical College, 1879. Licensed in California, 1886. Doctor Ainsworth was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Bonthius, Andrew. Died at Pasadena, April 6, 1929, age 55. Graduate of the Northwestern University Medical School, Chicago, 1909. Licensed in California, 1914. Doctor Bonthius was a member of the Los Angeles County Medical Association, the California Medical Association and a Fellow of the American Medical Association.

Leisenring, Luther M. Died at Mare Island, July 9, 1929, age 54. Graduate of the University of Nebraska College of Medicine, Omaha, 1901. Licensed in California, 1901. Doctor Leisenring was a member of the Solano County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

NEVADA STATE MEDICAL ASSOCIATION

R. R. CRAIG.....	President
W. A. SHAW.....	President-Elect
H. A. PARADIS.....	First Vice-President
R. P. ROANTREE.....	Second Vice-President
HORACE J. BROWN.....	Secretary-Treasurer
R. P. ROANTREE, D. A. TURNER, S. K. MORRISON.....	Trustees

OFFICIAL NOTICE

The Annual Meeting.—The time is rapidly approaching for our next annual meeting which will be held at Elko, September 27th and 28th. This will probably be only an announcement to some people, but to those that know the way Elko entertains, it will mean another of those times that no sane physician would want to miss. The local committee doesn't want to be handicapped by too much scientific program, so the number of essays will be limited to eight. Those eight will be chosen with great care and we expect to surprise you when you see the program.

We wish, also, to call your attention to another important medical event. On August 23rd, 24th and 25th Nevada is going to entertain the Pacific Association of Railway Surgeons at Reno. The Washoe County Society has pledged its support and will help to entertain our visitors, who will come from nine western states, and we solicit the coöperation of the members of the N. S. M. A. to help make their meeting a success. About two hundred visitors are expected, and it will be the largest medical convention ever held within our borders. It is hoped that all who can will attend this meeting, especially all who are railroad surgeons. All of the latter are eligible to membership and any that desire to join can obtain an application blank by writing to your secretary. Let's help the Pacific Association of Railway Surgeons to make this the banner meeting of their history.

UTAH STATE MEDICAL ASSOCIATION

H. P. KIRTLEY, Salt Lake City.....	President
WILLIAM L. RICH, Salt Lake City.....	President-Elect
M. M. CRITCHLOW, Salt Lake City.....	Secretary
J. U. GIESY, 701 Medical Arts Building, Salt Lake City.....	Associate Editor for Utah

OFFICIAL NOTICE

Attention is called to the new personnel of the Publication Committee. Under this arrangement all secretaries of the component county societies are automatically members of the Publication Committee, and one of their functions is to furnish to the editor each month during their term of office, such news as may occur in their society or its personnel, as well as a monthly report of their society meeting, not later than the tenth of each month. These reports will be coördinated and forwarded to the San Francisco office of CALIFORNIA AND WESTERN MEDICINE. It is hoped that in this way a fuller report of medical activities from all sections of the state may be obtained.

Place of 1930 meeting, Salt Lake City.
Time of 1930 meeting, to be announced.

Officers for the Year 1929-1930

President.....	H. P. Kirtley, Salt Lake City
President-Elect.....	Wm. L. Rich, Salt Lake City
First Vice-President.....	W. H. Budge, Ogden
Second Vice-President.....	David Gottfredson, Richfield
Third Vice-President.....	J. W. Hayward, Logan
Secretary.....	M. M. Critchlow, Salt Lake City Term expires 1931
Treasurer.....	E. D. LeCompte, Salt Lake City

Councilors.....	F. A. Goeltz, chairman, Salt Lake City Second District, term expires 1930
	C. E. McDermid, Castlegate Third District, term expires 1931
	E. R. Dumke, Ogden First District, term expires 1932
Delegate to A. M. A.....	Sol. G. Kahn, Salt Lake City Term expires 1930
Alternate Delegate to A. M. A.....	E. M. Neher, Salt Lake City Term expires 1930

Associate Editor.....J. U. Giesy, Salt Lake City
The following committee appointments for the fiscal year (1929-30) have been made by President Kirtley:

Scientific Work

G. G. Richards, chairman.....	One year
M. M. Critchlow.....	Two years
M. C. Lindem.....	Three years

Public Policy

J. C. Landenberger, chairman.....	One year
J. R. Morrell.....	One year
M. M. Nielson.....	One year
A. C. Callister.....	Two years
J. Z. Brown.....	Two years
H. E. Dice.....	Two years
D. C. Budge.....	Three years
T. J. Welsh.....	Three years
C. M. Benedict.....	Three years

Publication

J. U. Giesy, chairman.....	Two years
W. R. Tyndale.....	One year
Odeen Luke.....	One year
J. W. Hayward.....	One year
W. T. Elliott.....	One year
H. Asa Dewey.....	One year
B. E. Bonar.....	One year
H. E. Rich.....	One year
J. L. Aird.....	One year
G. M. Fister.....	One year

Public Health

R. S. Allison, chairman.....	One year
Ezra Rich.....	Two years
R. T. Richards.....	Three years

Medical Defense

E. F. Root, chairman.....	One year
W. G. Schulte.....	One year
E. R. Dumke.....	One year
J. P. Kerby.....	Two years
R. C. Pendleton.....	Two years
W. E. Whalen.....	Two years
R. A. Pearse.....	Three years
A. L. Huether.....	Three years
J. J. Galligan.....	Three years

Medical Education and Hospitals

L. J. Paul, chairman.....	One year
W. F. Beer.....	One year
R. A. Pearse.....	One year
Clarence Snow.....	Two years
E. D. LeCompte.....	Two years
E. F. Gianotti.....	Two years
B. I. Burns.....	Three years
A. J. Murphy.....	Three years
J. W. Bergstrom.....	Three years

Medical Economics

F. S. Bascom, chairman.....	One year
T. B. Beatty.....	Two years
Ezra Rich.....	Three years

Necrology

J. U. Giesy, chairman

Postgraduate Work

L. E. Viko, chairman
Sol. G. Kahn
W. R. Tyndale

Reference

J. Z. Brown, chairman
F. L. Peterson
Leroy Pugmire

Credentials

M. M. Critchlow, chairman
W. B. Preston
Arnold Robison

MISCELLANY

Items for the News column must be furnished by the twentieth of the preceding month. Under this department are grouped: Comment on Current and Recent Articles in the Journal; News; Medical Economics; Correspondence; Department of Public Health; California Board of Medical Examiners; and Twenty-Five Years Ago. For Book Reviews, see index on the front cover, under Miscellany.

NEWS

Physician-Superintendent of Stanford Medical School.—Dr. Ralph B. Seem, of the Billings Memorial Hospital of the University of Chicago, has been appointed Physician-Superintendent of Hospitals and Professor of Hospital Administration at the Medical School of Stanford University in place of Dr. R. G. Brodrick, deceased, appointment to take effect on September 1, 1929.

The Eighth Annual Meeting of the American College of Physical Therapy, November 4, 5, 6 and 7, 1929, Hotel Sherman, Chicago.—Chicago has again been selected as the annual meeting place for the clinical congress of physical therapy of the American College of Physical Therapy. One-half of each day will be devoted to a variety of clinics in the sections on medicine, surgery and allied specialties, and eye, ear, nose and throat. Scientific papers, clinical addresses, demonstrations of technique, and scientific and technical exhibits will comprise the remainder of a scientific program. Attendance at the congress is not limited to the fellows of the college. All duly licensed physicians, their technicians and assistants, properly sponsored, are cordially invited to attend all the sessions.

Program and other information may be obtained by writing to the executive offices, American College of Physical Therapy, 716-30 N. Michigan Avenue, Chicago, Illinois.

The American Association for the Study of Goiter will award a prize of \$300 and a medal of honor to the author of the best essay based upon original research work on any phase of goiter, presented at their annual meeting at Seattle, Washington, in September, 1930.

Competing manuscripts must be in the hands of the corresponding secretary by July 4, 1930, so that the award committee will have sufficient time to thoroughly examine all data before making the award.

Full particulars of other regulations governing details of the offer will be furnished on application.

Shockproof X-Ray Apparatus Now Available.—Simplification in design and improved controls have enabled the roentgenologist constantly to improve the quality of his work and obtain uniformly satisfactory results through the standardized technique which these improvements have made possible.

Shortly after the CDX was placed on the market the Victor engineering and designing organization, under the leadership of J. B. Wantz, started work on the development of a shockproof type of X-ray unit for the use of the roentgenologists in the medical x-ray field.

The development of the shockproof x-ray unit is considered as probably the most important contribution to x-ray science since the advent of the Coolidge tube. The knowledge and experience gained during these many years are reflected in the design of this new apparatus. Nothing has been left undone to bring to a realization the fine piece of workmanship, in justice to the important rôle to which it is believed this apparatus will be assigned in future radiology.

It is dedicated to that body of specialists, the roentgenologists, who have so immeasurably contributed to the advancement of medical science.

Eleventh Convention for the Revision of the Pharmacopœia of the United States of America.

In compliance with the provisions of the Constitution and By-Laws of the United States Pharmacopœial Convention, the president of the convention hereby invites the several bodies, entitled under the Constitution to representation therein, to appoint delegates to the Eleventh Decennial Convention to meet in Washington, D. C., on May 13, 1930. The members of the United States Pharmacopœial Convention, in addition to the incorporators and their associates, shall be delegates elected by the following organizations in the manner they shall respectively provide: Incorporated medical colleges, and medical schools connected with incorporated colleges and universities; incorporated colleges of pharmacy, and pharmaceutical schools connected with incorporated universities; incorporated state medical associations; incorporated state pharmaceutical associations; the American Medical Association, the American Pharmaceutical Association, the American Chemical Society, the National Association of Retail Druggists, and the National Association of Boards of Pharmacy; *provided that no such organization shall be entitled to representation unless it shall have been incorporated within and shall have been in continuous operation in the United States for at least five years before the time fixed for the decennial meeting of this corporation.*

U. C. to Offer Filipinos Aid in Health Work.

As an additional means of service to the people of the state, the University of California Institute of Tropical Medicine, recently organized as a part of Hooper Foundation for Medical Research, is opening a special clinic for Filipinos.

This new clinic will be in charge of Dr. H. G. Marquez, himself a native of the Philippine Islands, according to the announcement made today by Dr. Alfred C. Reed, professor of tropical medicine.

Dr. Reed explains that there are thousands of Filipinos in California, many of them not able to speak English well, and consequently rather backward about visiting the regular clinics. With one of their own countrymen in charge, however, the new clinic will avoid this difficulty.

In San Francisco alone the Filipino population is estimated to be about 2100. A staff of two doctors and a graduate student in the Medical School, will take care of the patients. These doctors are Dr. Paul G. Capps, and Dr. Garry R. Burke.—*U. C. Clip Sheet.*

Infirmary at U. C. at Berkeley.—With excavations already completed, construction on the new infirmary which is to be built on the east side of College Avenue, directly across from the old structure, will soon be under way. The equipment will be entirely modern and an adequate dispensary will be provided. The new infirmary will also contain enough wards for around 100 confined persons. Completion is being rushed for the fall of next year. The entire cost will be \$450,000.—*U. C. Clip Sheet.*

TWENTY-FIVE YEARS AGO*

EXCERPTS FROM OUR STATE MEDICAL JOURNAL

Volume II, No. 8, August 1904

From some editorial notes:

... *The American Medical Association Trustees.*—While presidents come and presidents go, the trustees stay on forever, or nearly so. It is the trustees who are really the American Medical Association, for everything that is done at a meeting must be again enacted by the trustees, in Illinois, in order for it to be a legally accomplished fact. . . .

... Gentlemen, the conduct of "the greatest advertising medium for proprietary medicines in this country"—the *Journal of the American Medical Association*—is in your hands. What are you going to do with it? Are you going to continue the policy of "Dollars; dirty or clean; Dollars"? . . .

... *Eliminate the Quacks.*—County societies should at once undertake the work of getting rid of the illegal practitioners within their territory. . . .

... The public should not be, for a day longer than is absolutely necessary, preyed upon by the quack and the faker. It is money in the pocket of the physician to allow this sort of thing to go on, for the quacks do more harm than good, and eventually the sufferer must go to the physician for relief. But the medical profession is built upon the rock of self-sacrifice; its every effort for generation after generation has been to prevent sickness; to do away with the necessity of calling upon the doctor for treatment by preventing the advent of that for which treatment would eventually be required. . . .

... *State Journals.*—At least two more state societies are on the road to that proper state of existence wherein they will own and publish their own journals. New Jersey and Ohio have the matter under consideration, and probably will eventually undertake the work. . . .

... *Value of Big Game.*—... The court records now show that discrimination is eliminated from the case when the medical practice law is in question; that the reputation or professional standing of a man is of no weight in the trial of the one fact—*Has this man a license to practice medicine or has he not?* . . .

From an article on "Tendon Transplantation" by S. J. Hunkin, M.D., San Francisco:

Some one and a half years ago I had the honor to read a paper before this association, dealing with the subject of tendon transplantation, in which I made sundry remarks that I expected would provoke criticism, but which fell unnoticed or unheeded. Added experience impels me now to reiterate some of those statements, which I deem worthy of your attention. At that time I also maintained a position on the technique of tendon work which I find is not tenable, and which I now desire to retract. I shall be content, however, to note especially a single instance of each character, although several such will be found upon comparison. . . .

From an article on "Intestinal Obstruction" by Charles D. Lockwood, M.D., Los Angeles:

The fate of a patient suffering from acute intestinal obstruction is largely determined in the first forty-eight hours, and it rests with the physician who first sees the case. Early diagnosis and prompt surgical intervention offer the only hope of a successful issue in the majority of cases. . . .

*This column aims to mirror the work and aims of colleagues who bore the brunt of state society work some twenty-five years ago. It is hoped that such presentation will be of interest to both old and recent members.

From an article on "Extracts from Recent Literature on Fourth of July Tetanus" by Frances Louise Newton, M.D., Woodland:

I have, from my earliest recollections, been interested in tetanus. The children that I knew warned each other against stepping on a rusty nail for fear of lockjaw, just as they taught each other the kinds of mushrooms that were poisonous and those that were edible. My interest has been much increased within the past year by the numerous articles that have appeared in the medical journals upon the subject, especially *The Journal of the American Medical Association*, whose attention was attracted by the appalling loss of life through the celebration of the Fourth of July recorded in the daily papers throughout the country. . . .

From an article on "Innervation of the Heart" by O. O. Withersbee, M.D., Los Angeles:

The need of more satisfactory measures for the care of patients suffering from shock has long been felt by physicians, and an attempt to meet the demands has in many cases been made with, perhaps, as little consideration of the true physiological derangement as is usual in the treatment of the most obscure maladies. . . .

From an article on "Determination of the Functional Capacity of the Kidneys, with Special Reference to Kidney Surgery" by M. Krotoszyner, M.D., San Francisco:

Since Gustav Simon of Heidelberg, on the 2d of August 1869, performed the first successful nephrectomy, and since he proved that this organ, considered indispensable to man heretofore, could be removed with subsequent benefit to the patient, surgery of the kidneys and ureters has made unprecedented advances, and may, in its technique, be considered complete and perfect. . . .

From reports of county medical societies:

Alameda County.—... The second paper was read by Doctor Shuey, on "Diet in Health and Disease."

"The way the majority of people eat is to take anything that pleases the palate. This popular standard is faulty. On the other hand, we have the food crank, such as the vegetarian. Both of these, the epicure and the food crank, seem to thrive and maintain a fair degree of health. As examples of this can be quoted the case of a vegetarian who averaged five pounds a day, and an epicure who averaged twenty-seven pounds daily, both of them keeping in fairly good health. . . .

... Discussion.—Doctor Stratton—I think that not enough stress is laid upon broths and soups, as they are nourishing and pleasant to take.

Dr. Von Adelung—The medical world has passed through all stages of peptonizing, sterilizing, etc., and those who have given the most attention to the subject have gone back to simple milk. It is a lamentable fact that most people eat too much.

Doctor Buteau—In the question of food, each person is a law unto himself. People, like engines, vary in the amount of energy they produce from the same amount of fuel taken. If food is not oxidized there is a loss of energy. Time is an important factor. All food, even liquid, should be taken slowly.

Doctor Milton spoke of the proprietary foods being largely alcoholic, and thought that they were prescribed too freely. . . .

San Francisco County.—... Doctor Philip Mills Jones, also a delegate from California to the American Medical Association, reported on the matter of inviting the association to meet in San Francisco next year. He said that the association was very favorably impressed with the idea, but as two meetings had already been held in San Francisco, it was voted to meet in Portland, Oregon, next year. . . .

DEPARTMENT OF PUBLIC HEALTH

By W. M. DICKIE, M. D., *Director*

Fourth of July Wounds Often Productive of Tetanus.—Many years ago large numbers of children in the United States died of tetanus following Fourth of July wounds caused by toy pistols and blank cartridges. In 1903 there were at least three hundred and twenty-five such deaths in children of the United States, most of these cases and deaths following injuries received through the use of blank cartridges. The source of the tetanus spore in such cases has not been fully established, but it is believed that the spore is on the skin of the victim and is injected into the wound made by the blank cartridge. The character of such a wound makes it particularly dangerous in the development of tetanus. The American Medical Association many years ago started a campaign for the observation of a safer and saner Fourth of July. Through the agitation and the publicity of statistics practically every city in the United States enacted some kind of an ordinance regulating the sale of fireworks and explosives. These restrictive measures have been productive of most excellent results in the reduction of deaths and injuries due to these causes.

There is an indication, however, that there is a growing tendency for some cities to rescind the protective measures that have been in force for so many years. The American Museum of Safety, in a survey of six hundred cities in forty-three states, in 1927, found that 195 deaths and 3,179 injuries occurred from the Fourth of July celebration of that year. Among the killed were thirty-one children under six years of age and 122 between the ages of six and twenty; forty-eight of the victims were burned, their clothing having been ignited by fireworks which were supposed to be of the harmless type. Toy pistols and blank cartridges caused forty-six deaths, firecrackers twenty-two deaths, and the eating of fireworks by small children caused sixteen deaths.

Health officers are somewhat concerned over the tendency to nullify local legislation pertaining to the sale of fireworks, particularly toy pistols and blank cartridges. Health officers take this stand because of the great dangers associated with the development of tetanus and lockjaw through the use of these disastrous toys. In the interest of the public health, it is important that the lives of California children be protected against tetanus which may be caused by wounds from toy pistols, caps and blank cartridges.

Now is Season to be on Guard Against Mussel Poisoning.—In July, 1927, following the appearance of 102 cases of food poisoning after eating mussels gathered along the California coast, the State Department of Public Health, in coöperation with the Hooper Foundation for Medical Research, began a series of investigations into this type of poisoning which have been carried on almost continuously since that time. While the exact cause of the poisonous condition in these shellfish has not been determined definitely, it is certain that mussels gathered in the midsummer months may be highly poisonous and the general public should be warned against the apparent danger in eating mussels at this season of the year. Recent examination of these shellfish indicates that a more toxic condition is present in mussels at the present time. Most cases of this poisoning have occurred during the month of July and as a matter of safety mussels gathered during the month, particularly, should be regarded with suspicion.

The investigations have revealed the following facts:

(1) The poison is not formed by bacteria nor is it due to any parasite, so far as is known.

(2) It is not due to asphyxiation or postmortem changes resultant from exposure to sun or changes in the tides.

(3) It is probably the result of a metabolism disease influenced by the food and spawning condition of the shellfish.

(4) Poisonous mussels can not be distinguished from sound mollusks either by appearance, behavior or cooking.

(5) Mussels may become poisonous within a few days and may remain so for several weeks.

(6) During the winter months, December to March, the poison disappears only to reappear late in March.

Health officers are advised to report by telephone or telegraph any cases of mussel poisoning that may occur within the territory under their jurisdiction, making certain to obtain samples of the shellfish which should be forwarded at once to Dr. K. F. Meyer, Director, Hooper Foundation for Medical Research, San Francisco.

Notable declines are seen in the prevalence of chickenpox, mumps, scarlet fever and whooping-cough.

The absence of epidemic poliomyelitis this summer is conspicuous.

Another case of tularemia has appeared.

The typhoid season is here.

CALIFORNIA BOARD OF MEDICAL EXAMINERS

By C. B. PINKHAM, M. D.
Secretary of the Board

In addition to the bills amending the Medical Practice Act, the following bills of interest to the medical profession were acted on:

Senate Bill 10 (Murphy) relative to aged pensioners—died in committee.

Senate Bill 29 (Crowley) establishing a professorship of nursing at University of California—died in committee.

Senate Bill 30 (Crowley) adding a new section to the Pharmacy Act relating to the registration of drug stores—passed (Chapter 156).

Senate Bill 36 (Inman) relating to county health officers, employment of public health nurses and dental hygienists by local boards of supervisors—passed (Chapter 199).

Senate Bill 37 (Inman) permits boards of trustees, etc., to employ public health nurses and dental hygienists—passed (Chapter 200).

Senate Bill 52 (Crowley) relating to certifications of persons other than registered nurses engaged in that occupation—died in committee.

Senate Bill 102 (Lyon) amending the present act preventing manufacture, etc., of adulterated or misbranded foods or liquor—passed (Chapter 202).

Senate Bill 103 (Rochester) creating a commission to select a state hospital site—died on file.

Senate Bill 104 (Crowley) an act to regulate nursing and placing supervision in the newly-created Department of Professional and Vocational Standards—died on file.

Senate Bill 105 (Crowley) amending the Pharmacy Act requiring prescriptions to be filed by duly regis-

tered pharmacists and kept on file for at least two years—passed (Chapter 131).

Senate Bill 107 (Crowley) amending the State Poison Law relative to economic poisons—passed (Chapter 132).

Senate Bill 109 (Lyon) permitting Board of Health to make sanitary examinations of places where food is stored—passed (Chapter 90).

Senate Bill 110 (Lyon) establishing standards for the grading and labeling of eggs—passed (Chapter 91).

Senate Bill 111 (Lyon) amending the act preventing manufacture and sale of adulterated or mislabeled drugs—passed (Chapter 92).

Senate Bill 132 (Baker) requiring the report to the police department of wounded or injured persons taken to a hospital or pharmacy—passed (Chapter 417).

Senate Bill 143 (Crowley) providing for the certification of non-registered nurses—died on file.

Senate Bill 182 (Young) regulating the sale, possession and distribution of habit-forming narcotics—passed (Chapter 216).

Senate Bill 199 (Sharkey) amending the Barber Examiners' Act—passed (Chapter 302).

Senate Bill 201 (Sharkey) referring to the hospital expense of persons charged with crime—passed (Vetoed).

Senate Bill 202 (Sharkey) relating to state hospital expense of a person charged with crime that shall be charged to a relative or estate—passed (Chapter 168).

Senate Bill 231 (Crowley) repealing prior act creating Board of Embalmers, relates to transportation and traffic of dead bodies, and does not interfere with the work of medical colleges—passed (Chapter 140).

Senate Bill 233 (Murphy) relating to sanitation of apartments, etc.—passed (Chapter 141).

Senate Bill 234 (Murphy) relating to sanitation of garages—passed (Chapter 133).

Senate Bill 258 (Crowley) amending Cosmetology Act—died on file.

Senate Bill 261 relating to examination of pure milk and its handlers—died on file.

Senate Bill 283 (Maloney) amending the Workmen's Compensation Act permitting acceptance of reports by examining physicians or licensed chiropractors—died on file.

Senate Bill 310 (Christian) relating to the transfer of persons from any department to any institution by the federal government—died on file.

Senate Bill 337 (Crowley) amending the State Narcotic Act and providing a court may commit drug addicts afflicted with tuberculosis or any other communicable disease to any state hospital—passed (Chapter 236).

Senate Bill 391 (Canepa) relating to state aid for orphans, etc.—died on file.

Senate Bill 395 (Fellom) making it a misdemeanor for hospitals to refuse aid or treatment to persons injured on the public highways—died on file.

Senate Bill 405 (Slater) amending the act describing methods of treatment of mentally sick in public institutions—passed (Chapter 761).

Senate Bill 410 (Crowley) creating the office of Chief of Narcotic Law Enforcement and divorcing from the Board of Pharmacy—passed (Chapter 188).

Senate Bills 436 and 437 (Pedrotti) relating to the care and commitment and maintenance of insane—both died on file.

Senate Bill 478 (Handy) permitting the State Department of Agriculture to make rules relating to rabies which boards of health must carry out—died on file.

Senate Bill 481 (Boggs) Bovine Tuberculosis Law—passed (Chapter 829).

Senate Bill 487 (Jones) relative to establishment of convalescent tuberculosis colonies with a stipulated sum for care of the individuals—passed (Chapter 432).

Senate Bill 497 (Carter) amending Pharmacy Act relative to compounding of prescriptions for medical practitioners—died on file.

Senate Bill 517 (Rochester) requiring that physicians and surgeons obtain necessary blanks from district

attorney for prescription of intoxicating beverages—died on file.

Senate Bill 550 (Inman) amending the Dental Act relative to meetings, examination fees, inspectors, etc.—passed (Chapter 877).

Senate Bill 618 (Rochester) regulating the selling of barbital, diethobarbituric acid or veronal—to be sold on prescription only and not to be refilled—passed (Chapter 449).

Senate Bill 684 (Crowley) providing for a professorship of nursing at University of California—passed (Chapter 689).

Senate Bill 815 (Jones) appropriation for Bureau of Child Hygiene—passed (Chapter 452).

Assembly Bill 16 (West) giving the Insurance Commissioner supervision over medical and hospital service corporations—died in committee.

Assembly Bill 113 (Miller) transportation of dependent children to homes outside the state, the county to pay one-half the total expense—passed (Chapter 528).

Assembly Bill 117 (Crowley) creating State Blind Benefit Commission; provides the board of supervisors may levy taxation for same along the same lines as the crippled children's bill—passed (Chapter 529).

Assembly Bill 124 (Miller) creating an institution for confinement and reformation of women misdemeanants—passed (Chapter 248).

Assembly Bill 156 (Williamson) amending Women's Compensation Act by providing that the average annual earning is the basis for computing disability—passed (Chapter 255).

Assembly Bill 166 (Wright) creating Division of State Aid for Aged and adding additional duties to the boards of supervisors to provide taxes, etc.—passed (Chapter 530).

Assembly Bill 167 (Sevell) providing for the confinement and rehabilitation of defective delinquents—died on file.

Assembly Bill 171 (Woolwine) unclaimed bodies of soldiers, sailors or marines not to be used for scientific purposes—passed (Chapter 345).

Assembly Bill 177 (Coombs) regulating the rehabilitation of physically defective persons—died on file.

Assembly Bill 249 (Bishop and Keaton) continuing revolving fund for rehabilitation of physically defective persons under eighteen—passed (Chapter 752).

Assembly Bill 309 (Coombs) providing for the creation of boards of mental health, appointees to be graduates of accredited medical colleges with physician and surgeon licenses and in practice three years—died on file.

Assembly Bill 394 (Mixer) regulating the sale and disposition of economic poisons—passed (Chapter 517).

Assembly Bill 490 (Byrne) regulating the care and treatment of mental defectives—died on file.

Assembly Bill 523 (Byrne) providing for a commission in connection with state hospitals for insane, and establishing a state hospital for the insane in Southern California—passed (Chapter 683).

Assembly Bills 561 and 562 (Jost) relative to the practice of pharmacy—died on file.

Assembly Bill 689 (Baum) providing for expense of persons committed to state hospitals under Narcotic Rehabilitation Act—passed (Chapter 406).

Assembly Bill 690 (Cloudman) relative to producing and selling imitation milk not applicable to manufacturers of distinctive food compounds—passed (Chapter 458).

Assembly Bill 692 (Baum) relating to expense of persons committed to state hospitals under the Pacific Colony Act—passed (Chapter 407).

Assembly Bill 719 (Scofield) providing that physicians, nurses and hospitals shall have a lien for services with a method of enforcement—died on file.

Assembly Bill 983 (Bliss) relating to commitment of persons to state hospitals, care and compensation—passed (Chapter 757).

Assembly Bill 1033 (Flynn) provides a licensed physician for city and county jails having more than fifty inmates—passed (Chapter 410).